GEOGRAPHY,
RESOURCES & ENGINEERING

July, 1945

EDISON ELECTRIC INSTITUTE BULLETIN

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JUL 20 1945

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PUBLISHED MONTHLY BY EDISON ELECTRIC INSTITUTE

THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

April, 1944 and 1945

SOURCE AND DISPOSAL OF ENERGY—MONTH OF APRIL

	1945	1944	%
GENERATION* (Net)			
By Fuel Burning Plants	11,606,946,000	11,123,648,000	+ 4.3
By Water Power Plants	7,024,069,000	7,289,023,000	− 3.6
Total Generation	**18,631,015,000**	**18,412,671,000**	**+ 1.2**
Add—Net Imports over International Boundaries	153,767,000	132,821,000	+15.8
Less—Energy used by Producer	75,525,000	167,592,000	−54.9
Less—Company use	119,278,000	137,045,000	−13.0
Net Energy for Distribution	**18,589,979,000**	**18,240,855,000**	**+ 1.9**
Losses and unaccounted for	1,971,484,000	1,851,246,000	+ 6.5
Sales to Ultimate Customers	**16,618,495,000**	**16,389,609,000**	**+ 1.4**

CLASSIFICATION OF SALES

NUMBER OF CUSTOMERS—As of April 30th			
Residential or Domestic	27,665,449	27,021,536	+ 2.4
Rural (Distinct Rural Rates)	1,161,631	1,111,014	.....
Commercial or Industrial:			
Small Light and Power	4,276,904	4,190,909	+ 2.0
Large Light and Power	151,716	149,285	
Other Customers	118,274	120,063	.....
Total Ultimate Customers	**33,373,974**	**32,592,807**	**+ 2.4**
KILOWATTHOUR SALES—During Month of April			
Residential or Domestic	2,744,861,000	2,592,325,000	+ 5.9
Rural (Distinct Rural Rates)	247,098,000	255,550,000	− 3.3
Commercial or Industrial:			
Small Light and Power	2,480,672,000	2,413,983,000	+ 2.8
Large Light and Power	9,658,326,000	9,525,545,000	+ 1.4
Street and Highway Lighting	168,127,000	166,693,000	+ 0.9
Other Public Authorities	679,310,000	790,355,000	−14.1
Railways and Railroads:			
Street and Interurban Railways	376,488,000	380,675,000	− 1.1
Electrified Steam Railroads	213,294,000	223,199,000	− 4.4
Interdepartmental	50,319,000	41,284,000	+21.9
Total to Ultimate Customers	**16,618,495,000**	**16,389,609,000**	**+ 1.4**
Revenue from Ultimate Customers	**$275,410,100**	**$270,365,900**	**+ 1.9**

RESIDENTIAL OR DOMESTIC SERVICE

AVERAGE CUSTOMER DATA—For 12 months ended April 30th			
Kilowatthours per Customer	1,175	1,104	+ 6.4
Average Annual Bill	$40.89	$39.30	+ 4.0
Revenue per Kilowatthour	3.48¢	3.56¢	− 2.2

(*) By courtesy of the Federal Power Commission.

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EDISON ELECTRIC INSTITUTE BULLETIN

Volume 13 JULY 1945 No. 7

E.E.I. Commercial Leaders Meet—Report on Undertakings for Stimulating Postwar Sales

A CONVENTION in a capsule last month pointed the way to increased postwar sales in practically every phase of the electric light and power industry's economy. Held in New York, June 4 and 5, the meeting took the place of the spring commercial conference which would have been attended normally by several hundred of the country's leading power company commercial executives.

Transportation needs of the nation's armed forces made it impossible for the Commercial Division General Committee of the Edison Electric Institute to call the usual conference. In consequence, 47 power company commercial officials, under the chairmanship of G. W. Ousler, vice-president in charge of sales of the Duquesne Light Company of Pittsburgh, held their capsule-sized sessions.

With a laudable efficiency of language, reports were made on what lies ahead for sales of electric light and power in residential, commercial, industrial and rural fields. In addition, comprehensive analyses were made by special committees on planning, basic sales training and wiring.

Some idea of the scope of the reports is gained through the knowledge that here in concentrated form was the best thinking of some 126 experts in a variety of categories of electric light and power sales. Altogether, 20 committees function under the control of the Commercial Division General Committee of the EEI.

The second day of the two-day meeting was devoted to reports on electric water systems, Better Light-Better Sight, a program for electrical living, and round-table discussions of liquid petroleum gas developments, range parts standardization and the electric modernization of school kitchens.

The meeting was declared to be highly successful not only because of the work reviewed but because the session offered proof of the effectiveness of the reorganization of the Commercial Division of the Institute.

Last fall leaders of the Edison Electric Institute gathered at Hershey, Pa., to create a new setup for the Commercial Division. The meeting in New York last month was the first full test of the worth of the reorganization.

After calling the meeting to order, Chairman Ousler quickly sketched the setup created by the reorganization. He said:

"This is the second meeting called since I have taken office as your chairman. For those who were not at Hershey I would like to say that our first action was a reorganization of our operations into four sections, under the Commercial Division General Committee, comparable to our company setups, namely, Residential, Rural, Commercial, and Industrial Power and Heating.

"In addition, there are three over-all committees, Sales Training, Commercial Planning, and Wiring, the work of which covers all sections.

"The four market sections each have a chairman who serves as a vice-chairman of the General Committee. Then, there are eight committees in the Residential Section, four in the Rural, four in the Commercial, and four in Industrial Power and Heating, making a total of 20 committees in the four market sections.

"The four chairmen of the market sections and the chairmen of the four over-all committees are a sort of advisory 'cabinet.' We have been holding cabinet meetings on the average of once a month.

"An Executive Committee of the Commercial Division General Committee includes all of the section chairmen plus those commercial executives reasonably accessible. This Executive Committee has met to discuss policy matters and to assist in the administration of the affairs of the General Committee."

[Ed.—In the December, 1944, issue of the EEI BULLETIN an article by Mr. Ousler contains charts of the Commercial Division's Sections and committees.]

Although some of the discussions cannot be released for general circulation at this time, several of the reports are printed in this issue of the EEI BULLETIN. Brief outlines of these reports follow:

As chairman of the Commercial Planning Committee, M. E. Skinner, vice president of the Buffalo Niagara & Eastern Power Corp., described the reports prepared by his group to date and told of others to be released.

Reports of the planning committee which have been issued or are in the process of being printed are Basic Material for Electric Utility Companies, An Appraisal of Our Competition, Rural Electrification, and Industrial Power Markets. Others in preparation, making a total of seven in all, are Market Problems in the Residential Field, Suggested Merchandising Principles, and Postwar Lighting Fields. This factual material is designed to help commercial and other executives in their postwar planning.

Harry Restofski, sales promotion manager of the West Penn Power Company of Pittsburgh, reported on residential studies as chairman of the Residential Section, detailing the work of commit-

tees on home lighting, electric kitchens, electric laundries and water heaters, indoor climate, home service, dealer coordination, and sales personnel. Mr. Restofski said that all of his committees had met at least once and some of them as many as four times.

Activities of the Commercial Section were described by the chairman, P. M. Alden, manager of the retail division of the Philadelphia Electric Company. He defined the scope of his studies as "the development of the use of electricity by customers in the distribution or supply of goods and services, as contrasted with those customers who convert raw materials into finished products." He gave details of the work of committees on commercial lighting, cooking and baking, heating and small motor application, market developments and sales personnel.

E. L. Kavanaugh, senior engineer, power sales division, Detroit Edison Company, and chairman of the Industrial Section, sketched the meetings held by his committees on industrial lighting, general power and heating, competitive service and sales personne.. His report not only revealed the thoroughness of the work of each of his committees but showed how liaison with other committees eliminated duplication of studies.

In detailing the projects of the Rural Section, the chairman, C. H. Leatham, vice president of the Monongahela West Penn Public Service Company, disclosed the magnitude of the problems faced in rural electrification, and told of the steps so far taken by committees on service extension, farm utilization, equipment distribution and sales personnel.

The Committee on Wiring was represented by its chairman, R. F. Hartenstein, superintendent of electric and steam sales, Ohio Edison Company of Akron. His committee, composed of a group on wiring techniques and a group on promotion, is working to make adequate wiring a part of every sales program, whether it be residential, farm, commercial, office, school, recreational or industrial.

M. R. Roger, chairman of the Basic Sales Training Committee, and customer and sales manager of the Middle West Utilities Company of Chicago, gave the results of the studies of his group; studies which have resulted in recommendations to the EEI Board of Directors.

During the second day the report of the industry's Water Systems Program was given by M. W. Arthur, vice president of the Consumers Power Company of Jackson, Mich.; details of the projects under way by the Better Light-Better Sight Bureau were sketched by H. P. J. Steinmetz, vice president, Public Service Electric & Gas Co., Newark, N. J.; and the Electrical Living Program report was presented by Mr. Skinner.

The round-table discussion on liquid petroleum gas was conducted by W. J. Cashman of Landers, Frary & Clark, New Britain, Conn.; that on standardization of range parts by Mr. Skinner; and that on electric modernization of school kitchens by G. E. Whitwell, vice president of the Philadelphia Electric Company.

The luncheon speaker for the second day of the meeting was Herbert Metz, sales manager of the Graybar Electric Company, his topic being "Selling the Selling Profession."

EEI Commercial Sales Section Activities

By P. M. Alden

Section Chairman

A report made at meeting of the Commercial Division General Committee, New York, June 4-5, 1945

THE Commercial Sales Section of the Commercial Division, Edison Electric Institute, hereby reports its activities since its organization in the fall of 1944.

The Commercial Sales Section is one of the four major Sections comprising the Commercial Division and includes four working Committees as follows:

Commercial Sales Personnel Committee
Commercial Market Development Committee
Commercial Lighting Committee
Commercial Heating & Motor Applications Committee

Since its organization the Commercial Market Development Committee has held three meetings. Each of the other Committees has met twice.

Definition of Scope of Activity of Commercial Sales Section

In order to clarify the line of demarcation between the work of the Commercial Sales Section and Industrial Section, it has seemed desirable to define the scope of activity of the Commercial Sales Section, as follows:

"The Commercial Sales Section is interested in the development of the use of electricity by customers engaged in the distribution or supply of goods and services, as contrasted with those customers (followed by the Industrial Section) which convert raw materials into finished products."

A – Over-All Section Activities

There are two over-all Section activities in which all four of the Committees comprising the Section have participated. These are:

1. *The Commercial Sales Log*

The first issue of the Commercial Sales Log was released early in May and sent to all member Companies.

It is proposed to release this bulletin at approximately bi-monthly intervals in the future, and to use it as a method of releasing interim report material from the Committees as well as other data which may be of interest to those charged with the responsibility of developing sales in the Commercial Market.

2. *Commercial Sales Conference*

On May 23 and 24 a Conference, sponsored by the Commercial Sales Section, was held in Pittsburgh, at which time the Committees reported to the Section membership as a whole, and there was an opportunity for general discussion and Consideration of Commercial Sales Problems.

We believe that this Conference was extremely helpful in giving all members of the Section a better understanding of the work being done by the various Committees. The Conference also brought into focus several problems

which will be the subject of future Committee study and report.

B – Report of Individual Committee Activities

1. *Commercial Sales Personnel Committee*

The Chairman of this Committee is Joseph S. Schuchert of the Duquesne Light Company. The Committee consists of six active members, including the Chairman and five corresponding members.

This Committee has undertaken a study of the selection and training of personnel for commercial sales work, and will issue periodic reports on this subject either through the Commercial Sales Log, or in separate report form. Among other specific items under consideration by this Committee may be noted the following:

(a) Aptitude Testing for Commercial Salesmen.

(b) The use of the Screened Application Form and the Patterned Interview.

(c) A Study of Typical Sales Organizations designed to cover the Commercial Market.

(d) A Study of Some of the Basic Factors to be Used in Directing and Judging Sales Results, including:
- Number of Customers per Salesman.
- Number of Salesmen per Supervisor.
- All-Service vs. Specialized Selling.
- Servicing Commercial Equipment.
- Approaching the New Commercial Customer.
- Salesmen's Remuneration Schedules.

(e) Evaluating and Judging Sales Results.

2. *Commercial Market Development Committee*

The Chairman of this Committee is L. R. Weaver, of the Philadelphia Electric Company. The Committee is composed of seven active members, including the Chairman, and one corresponding member.

This Market Development Committee might perhaps be more accurately named as a Market Study and Analysis Committee, in that all of its work is directed to the Commercial Market from the standpoint of the customer's needs and desires for equipment, rather than from the standpoint of any particular commercial applications.

The following projects are being undertaken by this Committee:

(a) *A revision of the "EEI Directory of Commercial Equipment Using Electricity"*

This Directory was originally prepared in 1937 and now requires extensive revision, in addition to the fact that the original copies have long since been sold out by the Edison Electric Institute. The purpose of this Directory is to put under one cover a list, which will be as complete as possible, of all types of electric equipment useful to commercial customers. We visualize that this will be of particular value to smaller Companies, which may not be in a position readily to assemble information of this kind.

This will be a continuing project, as it is obvious that many new manufacturers will come into the field in the immediate post-war period.

(b) *A Report Giving Suggestions and Ideas Relative to a Market Survey Among Commercial Customers*

This project is a development of an original study which proposed to assemble and coordinate the results of surveys made by individual member Companies of EEI and others, in the Commercial Field. As the study developed, however, it became evident that most companies had not done much of this type of work, and there was a considerable interest on the part of a number of Companies in a suggested survey program. As a result of this field information, the objective of this particular activity has been changed, and the report, when released, will, we believe, be of value to those companies which wish to know more about suggested methods of making and analyzing surveys in the Commercial Field.

(c) *A Review and Expansion of the Former "Directory of Commercial Business," which will include a statement of the principal electrical Applications in each Business Classification*

This Directory, which might better be called "A Guide to the Full Use of Electricity in Commercial Establishments," also is in need of revision and reprinting. This particular project will be carried on in cooperation with the Lighting, and the Heating and Motor Applications Committees, and we visualize that it will also be of particular value to smaller utility companies.

(d) *Preparation of a Detailed Study and Report on One or Two Principal Commercial Markets—For Example, Food Stores or Drug Stores*

These reports will develop basic data useful to utility sales organizations in obtaining a better understanding of our customers' problems, and in developing the use of electricity in the solution of those problems.

3. *Commercial Lighting Committee*

The Chairman of this Committee is Mr. Bruce J. Jensen of the Public Service Electric and Gas Company. The Committee consists of 8 active members, including the Chairman.

The following projects are being undertaken by this Committee at the present time:

(a) *Preparation of a report covering an Outline for a Salesmen's Manual*

The original objective of this particular project was the development of a Salesmen's Manual for men working in the Commercial Market. As the project developed, however, it became apparent that so much of the material which should be included in any such Manual has to do with local situations, that rather than attempt to prepare a Manual which would be suitable for all Companies, the Committee could be most helpful by outlining in some detail a type of Manual which could be prepared by local utility organizations. This is now being done, and this information will be released in report form in the near future.

(b) *A Study of "Plus Lighting" Applications in Commercial Establishments*

It is the belief of this Committee that there is excellent opportunity for the development of increased lighting business as a part of the over-all effort for higher intensity lighting, through the application of "plus lighting" units in stores and other merchandising establishments. The Committee is, therefore, preparing a report which we believe will be helpful in suggesting to member companies the various ways in which "plus lighting" can be applied to the advantage of both the user and the Company.

(c) *Study of some of the Problems inherent in the More Rapid Growth of the Use of Fluorescent Lighting anticipated in the Immediate Post-war Period.*

This study, which originated with a paper prepared by Mr. John Mueller of the West Penn Power Company, who is a member of this Committee, will be directed toward suggestions for the solution of some of the problems which will be brought about by the anticipated rapid growth in the sale and use of fluorescent lighting during the next few years.

Among the problems posed by this situation the following are particularly important:

1. Granting proper recognition to salesmen for "load holding."

2. Retaining present salesmen and obtaining new salesmen in the post-war competitive market.

3. Selling additional lighting load necessary to off-set losses which may be inherent in the conversion to fluorescent lighting.

4. *Commercial Heating and Motor Applications Committee*

The Chairman of this Committee is Mr. P. D. Lawrence of the Virginia Electric and Power Company. This Committee consists of 10 active members, including the Chairman, and 2 corresponding members.

The objective of this Committee is to collect and disseminate information relative to the principal heating and motor applications in the Commercial Field.

Commercial Electric Cooking, which had been planned for separate Committee consideration, has been combined with this Committee due to the inability to obtain a commercial cooking man who could serve as Chairman of a Commercial Cooking Committee.

The Committee work is divided into the following principal activities, each of which is the responsibility of a Sub-Committee Group, and will be the subject of a report.

(a) Electric Water Heating.

(b) Other Electric Heating Applications, including Spot and Strip Heaters, Infra-Red, Steam Generators, etc.

(c) Applications of Germicidal Lamps.

(d) Refrigeration and Frozen Food Distribution.

(e) Air Conditioning and Ventilation.

In connection with the promotion and sale of Commercial Electric Cooking Equipment, Mr. William O'Brien, Chairman of the Food Service Equipment Section of NEMA, appeared on the Conference Program at Pittsburgh, and stated that the NEMA Group desired to re-activate the Commercial Electric Cooking Council.

This poses the problem of developing a representative Commercial Electric Cooking Committee by Edison Electric Institute, which can participate with NEMA in the proposed inter-industry activity. It is the hope of this Committee that a sufficient number of utility men interested in commercial cooking can be released for work with Edison Electric Institute, to make possible the re-establishment of this group in the near future.

It is also interesting and encouraging to note that one or two new manufacturers of commercial electric cooking equipment expect to be active in this field in the post-war period.

EEI Residential Sales Section Activities

By Harry Restofski

Section Chairman

A report made at meeting of the Commercial Division General Committee, New York, June 4-5, 1945

THIS has been a year of committee organization and program development in the Residential Section. Five committees cover important residential markets — Electric Kitchen, Electric Laundry, Electric Water Heating, Home Lighting, and Indoor Climate. Three others cover important fields that cut across all the markets—Dealer Coordination, Home Service and Sales Personnel. With one exception, all the committee rosters have been filled, all have met at least once and one as many as four times, and all have developed programs and are working to carry them out. The Electric Laundry Committee was delayed in getting under way because its Chairman, Harvey Keys, was obliged to go South last winter for his health, and, though Harvey offered to step aside, we urged him to continue as Chairman and he was good enough to do it.

Taking them in alphabetical order, I will highspot the activities of these Committees.

Dealer Coordination Committee

Through this Committee, E. T. Moore of Virginia Electric and Power Company, Chairman, the Institute is set up to explore this important field and develop information and suggestions that will be of help to member companies. For years there has been a growing appreciation among utilities of the importance of dealers. Many companies have set up departments or designated individuals whose sole responsibility is dealer development. And this is wholly without regard to whether the utilities, themselves, do or do not sell appliances.

The Committee decided that its first job is to gather information from member companies as to their dealer organizations and activities. Such information will be helpful to members and will indicate to the Committee what its further activities should be. A questionnaire form has been drafted and is now in process of being revised.

Electric Kitchen Committee

This Committee, under the chairmanship of E. B. Haskell of The United Illuminating Company, has under its wing all electric kitchen appliances, large and small, including ranges, refrigerators, home freezers and electric sinks. Here are the more important projects on which the Committee is working:

1. The Committee has reviewed material of the former Modern Kitchen Bureau to determine what may still be usable. It believes that prints of the motion picture, "It Happened In The Kitchen," should continue to be made available. However, there is need for a completely new kitchen film. The Committee strongly recommends that such a film be produced as soon as possible.

Interest in the former film was excellent, despite the fact that its usefulness was cut short by the war. Today many more companies are planning vigorous promotion of the electric kitchen in general, and the electric range in particular, and more are equipped to show motion pictures. It all adds up to the fact that a kitchen film of high quality will find a ready market and can be made self-liquidating.

The Committee suggests that the present supply of the booklet, "Meals Go Modern Electrically," continue to be sold, with a gummed label on the appropriate page, carrying the statement of the Department of Agriculture warning of the danger of oven canning with wartime jars and closures. It recommends reprinting of this book with the relatively minor changes that are needed, so that this useful booklet will continue to be available. Up to the present time over 900,000 copies have been sold, this being evidence enough of its popularity.

2. The National Retail Lumber Dealers Association has asked for an article on kitchen planning for its Home Planners' Institute Manual. The Committee is preparing this article. The same basic material is being worked up into a proposed easel presentation on kitchen planning, for use by

home service and other utility personnel. Such a presentation will fill a real need. A condensed version of the easel story is being worked into a proposed handout piece. Both the easel presentation and the handout piece would be self-liquidating.

3. Because of the discontinuance of the Modern Kitchen Bureau and the loss to electric companies of its helpful services, there is great need for an electric utility industry kitchen program, and the Committee strongly recommends that one be developed. If the proposed "Electric Living Program" goes forward, it will no doubt include preparation of needed plans and helps for vigorous promotion of electric kitchens. If that program should not go forward, then prompt consideration should be given to development of an electric kitchen program by the Institute.

Electric Water Heating Committee

The Electric Water Heating Committee, H. P. Megargee, American Gas & Electric Service Corporation, Chairman, is at work on a very full program. Utility interest in this market has grown tremendously, with a constantly increasing number of companies having off-peak water heating rates, and including active promotion of this market in their postwar plans. One very comprehensive survey among electric companies shows that water heating is expected to make a bigger contribution to postwar increased average residential use than any other market.

The Committee is working on both technical and sales projects. Among them are:

1. A study of the extent of acceptance of N.E.M.A.-E.E.I. standards for electric water heaters. Widespread acceptance of these standards is essential if electric water heating costs are to be substantially reduced.

2. Gathering information from utilities regarding the use of pressure and temperature relief valves. It is hoped that this will lead to specific suggestions as to the best ways of protecting water heaters against excessive temperature and pressure. At present there is no uniformity of practice, though the problem is basically the same everywhere.

3. An attempt to work out simple formulas or charts to guide salesmen in the selection of the proper size of water heater. Formulas or charts would be developed for use with the more common off-peak water heating periods. A study of yardsticks now suggested by manufacturers and utilities clearly shows the great need for better methods.

4. Preparing an outline of the most successful water heating promotion plans used by utilities.

5. A study of the adequacy of the N.E.M.A.-E.E.I. water heater standards to meet the demands created by automatic washers.

6. Preparation of specimen installation specifications for water heaters These would not be recommendations, but rather examples of the best practices gleaned from specifications adopted by companies who actively promote electric water heating service.

7. Preparation of a primer on the load-building possibilities of electric water heaters, primarily for the benefit of executives.

8. Development of water heater test specifications.

Home Lighting Committee

The Home Lighting Committee, under the chairmanship of H. A. Stroud, Monongahela West Penn Public Service Company, has had two meetings. Its program includes:

1. Gathering and making available to member companies information on trends in home lighting. There is much more uncertainty regarding this market than most other important residential markets. Information is needed, for example, as to probable effects of fluorescent, on design trends, on price trends, on availability of equipment.

2. Attempting to develop a plan for the promotion of good fluorescent kitchen lighting. It is obvious that fluorescent home lighting is going to come, and that the room likely to be most quickly affected by fluorescent lighting is the kitchen. Prewar, many cheap adapter-type, fluorescent kitchen units were coming on the market and finding a ready sale. Without proper guidance, customers will continue to buy and use fluorescent kitchen fixtures of cheap construction, providing inadequate lighting, and operating at low power factors. One way for utilities to encourage good fluorescent kitchen lighting is to actively promote the sale of good fluorescent fixtures. In doing this, the utility also prevents any question of whether it is opposed to fluorescent lighting, per se.

The committee is attempting to develop a general specification for a shielded fixture of adequate wattage and high power factor, that manufacturers could make in quantity at a list price that would create a broad market.

3. Cooperating in conducting Regional Lighting Conferences such as have already been held in Pittsburgh and New York, and plans for which were worked out by the Institute's former lighting committee.

4. Keeping informed as to the progress of home lighting equipment certification programs, and helping to publicize them to member companies at the proper time.

Home Service Committee

The Home Service Committee, under the chairmanship of Fern Snider, Georgia Power Company, is actively at work on an important three-step program.

1. Development of a Home Service Manual. Such a Manual will be extremely helpful to utilities planning to organize or to expand home service activities. It will also serve an excellent purpose in home economics departments of schools and colleges to stimulate interest in proper training of home economists for home service work. The Manual will include data on training home service personnel, on home service programs, on methods of carrying out the programs, and on job analysis and result reporting. A draft of the Manual is now ready for final editing.

2. Issuance from time to time of The Home Service Exchange. This is a mimeographed publication, making available to member companies home service ideas and plans that have worked. It is just the thing to assist home economics directors and supervisors in effective program planning. The first two numbers of The Home Service Exchange have already been prepared and distributed, the third number will be ready soon.

3. The holding of Regional Home Service Conferences. These would be for relatively small conference groups—not more than twenty—of home service directors. These Conferences will be held in various parts of the country, making long trips unnecessary. They will give those in responsible charge of home service activities an opportunity for discussion of problems of mutual interest. Home service directors are anxious for such an opportunity.

A complete manual, outlining suggested program and giving full details for holding such conferences, has already been prepared. A New England Conference will be held in Boston this month, to be followed shortly by one in Atlanta. These will be sort of pilot-conferences, and experience gained in conducting them will be helpful in later conferences.

Indoor Climate Committee

The Indoor Climate Committee, under the chairmanship of E. A. Freund, Union Electric Company of Missouri, has had one meeting, has carried on considerable work by correspondence, and carries on with a two-day meeting later this week. It has defined the scope of its work as including: "Any equipment operated or controlled electrically, contributing to the improvement of climate conditions within the home, thus resulting in more healthful living conditions." It has prepared a surprisingly long list of equipment which comes within this definition.

It is working on the following projects:

1. Gathering information on the annual kwhr consumption of the more important items of indoor climate equipment. This will be made available to member companies, so they can better appraise the various parts of this important market.

2. Preparation of a proposed simple booklet promoting good indoor climate in the postwar home. This would be used as a handout piece or mail enclosure, and would be sold on a self-liquidating basis.

3. Gathering and summarizing in one report experience in various parts of the country in electric resistance heating in residences. While this form of house heating has been used in only a few areas and to a very limited extent, interest in it is widespread. It will be helpful to the utilities to have all the important data in one report.

4. Gathering information on the present status of residence heating by means of the electric heat pump or reverse cycle of refrigeration. Here, again, is an interesting field that gives promise of practical use in house heating in some parts of the country. A summary report will be of service to member companies.

5. Studying plans for organizing, under utility sponsorship, local groups interested in promoting the sale and installation of indoor climate equipment.

Sales Personnel Committee

The Sales Personnel Committee, under the chairmanship of C. A. Stevens, Public Service Electric & Gas Company, having had four Committee meetings, has its program well advanced. This program is made up of four major items:

1. Preparation of material on the various available sources for the recruitment of residential salesmen.

2. Study and review of application blanks and interview records, and preparation of

a report on this general subject of selection procedures for residential sales personnel.

3. Gathering information by means of a questionnaire, on the methods of compensating various types of residential sales personnel, including particularly those who sell appliances or supervise their selling, and those who work as dealer coordinators or dealer representatives and their supervisors.

4. Study of residential sales personnel training needs, and advising the Institute's Training Committee regarding them.

All these projects are well advanced. Reports on recruitment and on selection have been drafted, and the questionnaire on compensation has just been mailed to approximately one hundred electric companies. Questionnaire results, in due course, will be summarized, and a report will go to member companies, including the material on recruitment, selection and compensation.

EEI Industrial Sales Section Activities

By E. L. Kavanaugh
Section Chairman

A report made at meeting of the Commercial Division General Committee, New York, June 4-5, 1945

FOLLOWING the meeting at Hershey, Pennsylvania, in October, 1944, when Mr. Ousler outlined the plans for reorganization of the Commercial Division which you approved, the Industrial Power and Heating Section was organized and our first meeting was held at EEI Headquarters on November 20-21. The Section was divided into four committees—(1) General Power and Heating, (2) Competitive Service, (3) Industrial Lighting, and (4) Sales Personnel and Training. Appointments were made from the former Industrial Power and Heating Committee, EEI, which had functioned so well for a number of years prior to 1944. It was decided that the Industrial Section would operate most efficiently by continuing to meet as a group for discussion of general power problems and the reports of progress on assignments made to the various individual committees. Meetings of the separate committees were held prior to the opening of the General Sessions. Three General Section Meetings were held, one in New York, one in Buffalo and one in Philadelphia about three months apart.

The *Competitive Service Committee,* E. M. Clapp, Georgia, Chairman: This committee was to study present and future competition of all the sources of power and heat for industry and keep us advised as to possible future trends and developments in the entire competitive market. This committee was to study taxes and finance as it has to do with private plant competition, along with sales methods and progress of competitive equipment manufacturers.

The committee have reported on:

1. Deisel operated mine locomotives
2. Infrared drying from fuel—using Selas or Burdette burners
3. Use of electric infrared drying in the pottery industry versus fuel-fired equipment
4. General competition, including Diesel and gas engines
5. The importance of taxes in competitive power calculations

This latter report points out that formerly corporate income taxes were relatively low and they had very little effect upon the competitive power situation. Present income and excess profits taxes are such as to now have an important bearing upon decisions governing competitive power problems. For example, a private plant costing say, $50,000 might show a saving over purchased power if we used the usual method of calculation, i.e., total operating expense plus say, 15 per cent Fixed Charges—Interest, Depreciation and taxes. But if the comparison is set up involving excess profits taxes the picture is bound to change and may even result in wiping out any apparent savings when based on the old method.

An outline was completed by the Committee for the expansion of the steam competition section of the Power Sales Manual. Pending the completion of actual expansion, the outline has been found useful as a comprehensive check list of items to be considered in meeting any competitive steam threat. It lists many items to look for in order to reduce process steam requirements. Also a similar number of items that enter into the cost of operating existing plants as well as proposed new plants—i.e., indirect as well as direct power costs, establishing the rate for fixed charges, the size of generating units to handle possible future plant expansion, auxiliaries required, pumps, heat exchangers, feed water heaters, etc. It suggests that typical steam operating data under varying load conditions be set up in graph form for easy interpolation along with a number of other important and useful suggestions.

The Industrial Lighting Committee, J. R. Hartman, Cincinnati, Chairman: They are revising the Industrial Lighting Section in the Power Sales Manual because the development of improved lighting in industry during the past four or five years has made this section a bit out of date. They will continue to report on industrial lighting developments along with engineering and sales experiences. Mr. Hartman is working with the Lighting Committees of the other Sections of the Commercial Division in arranging a program for the conduct of future Regional Lighting Conferences.

Personnel and Sales Training Committee, Charles Snyder, West Virginia, Chairman: Are arranging a practical sales training program for utility industrial men. They are working closely with the General Commercial Sales Training Committee on *basic* training techniques and the fundamental principles of selling. A plan for specific training of Power men is being arranged by this committee, using the Power Sales Manual as a background. A draft of the job analysis has been completed and an outline for an Instructors Manual, together with detailed outlines for Lesson No. 1, was submitted to the Section at our last meeting on April 24. This training plan for Power men will include:

Qualifications for the work
Duties of the Power salesman
Maintaining customer service standards
Retaining existing business and obtaining all profitable new business in the Industrial Market

It will also outline the need for knowledge of his customers' operations

which the Power man must acquire to enable him to do a successful job of selling power. The Personnel and Sales Training Committee recommends that we do not include a provision in the Vocafilm budget proposal for the preparation of sound slide films at this time and will use available industrial film instead. They do, however, request consideration of an appropriation of $2,000 to be used as required to engage a reliable educational institution or individual to prepare and/or advise on, the preparation of a Leaders Manual for Industrial Sales Training—the amount used to be liquidated, of course, by the sale of the courses. By using the material already available in the Power Sales Manual along with a well prepared Instructors Guide—supplemented with available industrial film—the committee are certain a sound training program can be arranged at a minimum cost. They have already progressed with the listing of the available industrial film and no doubt, could complete their program within a reasonably short time if the general Sales Training Program, which will be outlined later, is approved.

I believe that we all realize that competition in the industrial end of the business is bound to be more keen than ever before. Already a number of members of the Industrial Section have reported increased customer interest in steam driven generating equipment. The Diesel people also are becoming active. They have learned how to build engines on a production basis with the resultant reduction in overall cost. There will be numerous pieces of used Diesel equipment available following the end of hostilities, if not sooner. There will be plenty of oil available at prices no higher than at present. Thousands of the boys now in service are more familiar with Diesel operation than they were five years ago. There will be a lot of engines available and a lot of people attempting to sell them to our existing customers. This sort of thing, along with our planned promotion for the increased sale of new electrical equipment and broader use of our Industrial service certainly indicates the need for a sound sales training program for the new men coming into this end of the business, as well as a refresher course for the older men who may find need for it.

The General Power and Heating Committee, under the direction of R. G. Ely of New Jersey: It was their job to study industrial markets for opportunities to increase kilowatthour sales and report on the development of new power-using equipment within industry. They made an exhaustive study of *Industrial Power Markets* and a report was submitted to the Commercial Postwar Planning Committee. Among other things it is pointed out in the report that the growth and health of industry in any area has a good deal to do with increasing sales for residential and commercial purposes.

The report also contains the following:

1. Utility Power Marketing
   - Postwar Industrial Sales Objectives
   - Retention of present business
   - Complete electrification of all industrial plants
   - Development of the area served
   - The job of selling power and training of personnel
2. The General Industrial Trend
   - Discussion of previous forecasts
   - General trends in certain industries using large blocks of power
   - Load behavior following first World War
   - Chart of Sales of Industrial Power 1912-1950.
3. Survey of Major Industries
   - Expansion of individual industries
   - Providing markets for large quantities of central station power
4. Industrial Transition
   - Larger government-owned plants operated as multiple tenant structures for industrial occupancy—Postwar
   - Disposal of government-owned plants and surplus property.

Factors that affect industrial loads are discussed in detail in the report in order that they may be interpreted by any company in terms of their local conditions and problems. Forecasts that have already been made are reviewed to indicate the general trends with respect to certain industries, to set up an objective, in industrial sales and to guide our thinking toward that objective.

Other assignments of this committee are the study of electronics and induction heating, particularly in the low frequency range. Progress has been reported on these and other methods of heat-treating of metals.

Industrial Section Committee

Power Sales Manual

The Industrial Section Committee as a whole assumed the responsibility of reviewing the Power Sales Manual, making such additions and revisions as were deemed necessary to bring it up to date. We in the Committee feel that the Power Sales Manual has answered a real need for a concise reference source covering the fundamentals which the Power man can use to advantage in his job of selling the many and varied uses of our industrial service. The Manual now contains 15 sections, with which most of you are familiar. During the year, four new sections were issued:

SECTION XII, Production Methods Analysis
SECTION XIII, Induction Heating of Conducting and Non-Conducting Materials
SECTION XIV, Electric Welding
SECTION XV, Materials Handling

Section XVI on Motor Applications and Control has been reveiwed by members of the Committee and is about ready to be submitted for final editing.

Revisions of the various sections already contained in the Manual were recommended by a subcommittee and assignments to complete these revisions were made. If the Manual is to give full value, this procedure must be a continuing activity of this Section to periodically review, revise and make additions. The status of revisions and supplements is as follows:

Section II—Electric Furnaces

Draft of supplement, covering additional new information on Electric Heating and Heat-Treating, completed.

Section III—Cooking, Baking, Stills and Sterilizers, Midget Heating Devices

A supplement is in preparation which will emphasize industrial cooking and provide additional information on recent small industrial heating and sterilizing developments.

Section V—Industrial Lighting

Being rewritten by the Lighting Committee.

Section VI—Commercial and Industrial Refrigeration

Draft of supplement completed which will cover locker plants, refrigeration in metallurgy and industrial processes, and refrigeration of trucks for industrial purposes.

Plans have also been made for supplements to Section IX on Competition and, Section XI, Electrical Uses in the Petroleum Industry.

Liaison with other Committees

In order to cooperate with other committees and avoid duplication of effort, Paul W. Lyman, Carolina Power and Light Company, of this Section has been designated as liaison representative on the Heating and Motor Applications Committee of the Commercial Section. Francis McQuillin has been designated as liaison representative of the Industrial Section on the Rate Research Committee.

An Appraisal of our Competition

The Committee was responsible for the furnishing of basic data and preparation of most of the text of Section II of the report of the Commercial Planning Committee—"An Appraisal of our Competition." We believe that this report along with that submitted by the General Power and Heating Committee of this Section on "Industrial Power Markets" will be of extreme value to Industrial Divisions of all utility companies in developing new markets and protecting from loss of business to competitive sources, postwar.

Interference caused by induction heating equipment

During the past four or five years, the use of high-frequency supply for heating of metals as well as non-metallic materials has expanded rapidly and the successful application of this method to many industrial heat-treating and drying applications has stimulated interest in further development. There have been indications that promiscuous use of high-frequency equipment might cause interference with radio and other communicative facilities. Two instances of trouble have been reported; one in Pittsburgh and the other in Cincinnati. They were not serious but caused some concern. The equipment manufacturers have applied to the Federal Communications Commission for a rather broad frequency allocation—apparently without much success. The Industrial Section as a whole feel that it is desirable to keep the cost of all heating equipment as low as possible so as not to limit the market. With this in mind, the committee requested me to take up through the proper channels, the request that the appropriate engineering or equipment committee (EEI) determine if some simple inexpensive method of shielding is practical. The question appears closely related to the work which has been under way in the field of radio interference for some time.

****Their theory was that if the allocation was sufficiently broad, they could design the equipment to stay within the prescribed channels.*

Round table discussions by all members of the Industrial Section were held at each meeting, on utility problems of general interest, such as:

1. Community development
2. Contract renegotiation
3. Dealing with non-utility producers
4. Competitive equipment costs
5. Present vs. postwar markets
6. Sales personnel for present and future conditions
7. Effect on industrial sales caused by military cutbacks of production schedules
8. Migration of industry
9. Conversion to civilian production
10. Rates, demand intervals, auxiliary breakdown
11. Meter service rackets

John H. Scott, American Gas and Electric Corporation, one of the most conscientious members of the Section, passed away on February 26, 1945. Appropriate resolutions were sent to his widow and H. M. Sawyer of his Company.

We believe we have covered the field pretty well, but would welcome suggestions of what we should be doing and are not, so that this Section might do even a better job for the Industry.

EEI Wiring Committee Activities

By B. F. Hartenstein
Committee Chairman

A report made at meeting of the Commercial Division General Committee, New York, June 4-5, 1945

WE all know the importance and value of adequate wiring, whether it be in a store, a factory, or a home. We all know the important part it plays in any sales program. We all also know that through the efforts of the Edison Electric Institute Wiring Committee, the National Adequate Wiring Bureau, some utilities and manufacturers, adequate wiring was beginning to receive consideration in new building construction before World War II. Many utilities had wiring departments who did nothing else but design wiring for all types of construction.

Let's look, for a moment, into the postwar era. First of all, practically no utilities have wiring departments. There has been very little publicity given to adequate wiring except in the last month or two due to government restrictions. To my knowledge, at the present time there is one new wiring handbook on the market, made available through a large manufacturer. Just recently there have been several bulletins on adequate wiring published. This is the first inkling we have had of the large educational program that will be necessary as soon as the war is over. Mr. and Mrs. John Q. Public must be sold the adequate wiring story. Utilities, the Edison Electric Institute Wiring Committee, the Adequate Wiring Bureau, and as many manufacturers as possible must do everything in their power to promote this wiring story. It must be put in every sales program, whether it be residential, farm, commercial, office, school, recreational, or industrial.

Therefore, in view of the above, it was deemed advisable to expand the scope of the EEI Wiring Committee this year to include not only work of a technical nature, but also to promote adequate wiring by publicizing the work done by the Technical Section of the Wiring Committee as well as preparing articles having to do with adequate wiring, and the re-editing of other items of interest on wiring that were prepared in a technical manner that could be rewritten in layman's language and published in national magazines. This work would be done by a Promotional Section.

At the Wiring Committee meeting held in New York at EEI Headquarters on April 10 and 11, these two Sections of the Committee were set up. H. R. Stevenson of the Detroit Edison Company accepted the job as Chairman of the Technical Section and R. E. Mausk of the Cleveland Electric Illuminating Company was appointed as Chairman of the Promotional Section.

Some of the things the Technical Section intends to work on this year are as follows:

1) Prepare a Manual of Installation Practices. Such a manual would be very useful to all utilities and would show the various methods utilized for the installation of wiring for ranges; method of installation for wiring and plumbing of water heaters; methods of installation for wiring of laundry driers, attic fans, room coolers, and other appliances for which utilities sometimes install wiring.

2) Prepare drawings for installation of wiring and plumbing of water heaters for the E.E.I Water Heating Committee. We were advised by the E.E.I. Water Heating Committee last week that they would be glad

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Looking Ahead in Advertising

For Coordination of Utility Service, Sales and Appliance Advertising for Better Public Relations

By Ashton B. Collins

A talk before the New Jersey Utilities Association at Sea View, N. J., May 25, 1945

BOTH institutional and sales advertising to be successful should cause the customers to vote for you in one way or another. They are figuratively voting for you when they think or talk good-will for you and they vote for you when they purchase your products or the appliances that use those products. When they "plug in," they should be "voting" for you—and they should be reminded of it.

Now advertising and selling in the utility business have rather naturally gone together hand in hand. It is hardly necessary, I know, to review for you the early days of utility advertising and we can merely remind ourselves that after institutional and preferred stock advertising, the advertising of appliances, starting modestly enough, expanded on a large scale and in the eight or nine years prior to Pearl Harbor appliance advertising stole the spotlight until war shoved appliances into the background.

Pearl Harbor Gives Institutional Its Chance

It was then that institutional advertising again came to the fore and that was fortunate, because the glamour of appliance advertising and sales had put the service of the utility company back of the appliances and into total eclipse. Utilities now have had three years in which to rediscover for their patrons the great value of utility services and, while much more could have been done, many companies have succeeded in getting their company's story before the people.

Never Again!

Many executives now realize that never again should the service of the utility itself be completely subordinated to the merchandise tools that use it.

Every tub should stand on its own bottom; and no matter how marvelous a job of appliance sales and advertising is done by manufacturers and dealers, the utility should not play second-fiddle. Or, to put it another way, even though it is recognized that appliances build load—*that load is not a by-product of appliance sales.* After all, appliances are but inanimate tools until they are energized by the powerful services back of them.

Again, I say, the two go hand in hand.

Cross-Currents

At this point I want to call your attention to some cross-currents in the electric industry in the past few years.

In the early days, appliances were built almost wholly to engineering specifications and were considered utility devices. They were not ornamental or attractive—in fact, they were ugly.

Later, particularly in the appliance era prior to Pearl Harbor, manufacturers developed and promoted more efficient, more useful and more glamorous appliances to the point where they became ornaments, as well as utility devices.

Then, manufacturers and utilities alike, sold the glamor, as well as the other values, of these appliances, and, consequently, sold up to higher prices.

Originally appliances in the early years were high-priced. Soon larger production brought cheaper models, which, in turn, were followed by the streamlined models at higher prices. The public *would not accept just cheap models.*

Likewise, in those early days, the rates for electricity were high. Later they came down as the load-building went up. But, HERE IS THE RUB. Prices of appliances stopped going down, but the rates of the electric companies never did stop the downward trend.

The street called Price Street seems to have been a one-way street for utility services, but it is a two-way street for appliances.

Probably that is because only one group has to do with the sale of electricity and gas—that's the utility group. But several groups have to do with the sale of appliances—namely, the manufacturers, jobbers and dealers; *and they have to make a living.*

For years now, appliances have been sold on the basis of customer benefits; but electricity has been sold largely on penny cheapness, to the point where everybody expects nothing else. No wonder utility rates are such a beautiful target for politicians and public alike. They've asked for it. They've been "penny-wise and pound-foolish."

Appliances Upward—Electricity Downward

And so, unfortunately, we now have conflicting trends and cross-currents in the business today. Utility services are selling downwards to bottom cheapness, while manufacturers and others are selling the customer benefits of appliances—selling upwards.

Pennies Versus Dollars

We are talking *pennies for electricity* and *dollars for appliances.* We are encouraging the customers to look for lower electric bills, while we encourage them to buy appliances that will increase those bills *silently, secretly and suspiciously* in the eyes of the customer.

The purchase of one major appliance by a customer is greater than the total amount of that customer's electricity for a whole year, yet they never figure the appliance as expensive, but the small cost of the service behind it they always consider expensive, no matter what it is. It is always under suspicion by the customer, and, therefore, constantly vulnerable to political attack.

And by our harping upon service for pennies, we encourage our public to expect nothing else. We have told a lot of people that electricity is cheap—but they still think any electric bill is too high.

A public service commissioner of one of our largest States stated in a published report on the service of electricity, "Essential in the life and activities of nearly every individual in the State . . . the cost of these services constitutes an important element in the family budget . . . it is a notable fact that after three years of rising prices generally, the cost of electric service has not increased since the war. On the contrary, during the war years there have been substantial reductions in the cost of these services."

The commissioner's reference to "nearly every individual in the State" has a definite "voter" implication. Also, his inclusion of the *cost* of electricity as an important element in the family budget magnifies that modest service out of all proportion to the major items of the budget, such as food, clothing, rent, etc.

Note that he refers to it as the "cost of" not "rates for" electric service. In other words, a dangerous doctrine of fixation, if not repression, for electric service.

To the Poorhouse!

In other words, everybody is encouraged to look for continued reductions, and if this keeps up, it is a one-way alley that leads to the end of the road and stagnation—a strangling of the industry that furnishes these great services and has contributed so much to the prosperity of all the people.

The trend should be reversed. It should stop while there is still time—or else the utility industry will find itself in the same shape the railroads were in, a few short years ago, when they and others kept talking cheapness and bragging that they were selling transportation for a lower cost per ton mile than ever before, and were constantly bringing that down. Well, they succeeded in bringing themselves down with it; many went into bankruptcy and it has taken a war to save them, at least temporarily. *And nobody ever built a monument to a bankrupt!*

Unless we can reverse our penny advertising and selling of electricity, we will never stem this tide against us; nor will we get the public in the right frame of mind.

We must sell *Dollar Services—Not Penny Electricity*.

In the first place, customers don't get a bill at the end of the month for pennies—it's a bill for Dollars. In fact, no customer can purchase a penny's worth of electricity, and the company doesn't bill them for 550 pennies; no, it's a bill for $5.50.

Other Merchants Sell Upwards!

No one buys neckties at a nickel for each stripe on the tie, or pennies based on the number of polka dots on the tie! No—they buy a tie for $1.00 or $3.50 or $5.50—a complete job or piece of merchandise.

All of you sometime during your life have bought a lead pencil. Back in your school days you most likely paid a penny for a pencil, but every now and then you splurged and bought yourself a nickel pencil . . . you were the envy of the crowd! You can still buy penny pencils and nickel pencils, but you don't. I don't know what kind of pencil you have in your pocket now, but I'm willing to bet it is not that kind. Pen and pencil companies have been telling you how sorry they are that they can't supply the demand fast enough—and they are talking about $64.00 pen and pencils. $64.00 sets plus 20 per cent Federal tax—$12.80 tax. Total $76.80. You can still buy penny pencils, but people want the expensive ones because they have been sold on the idea that they should have the better and more valuable kind.

Tin Cups

No, the customers can't buy a penny's worth of electricity, *but we go around in the electric business with tin cups in our hands, begging people to buy electricity for pennies!*

What To Do!

Why shouldn't we sell our customers up just as the pencil folks have done, and it can be done.

Instead of selling the thought that the customers pay for only the kwhr they use, why not sell them on the tremendous values of constant 24 hour a day service—service that is at every convenience outlet the moment it is needed and much of it working day and night constantly (electric clocks for instance). Service that runs the refrigerator automatically day and night without the need of someone standing by to turn it on and off! Service that is sitting behind the outlet inside of their homes just waiting to do some work!

If the customers had to pay for that waiting time, their bill might well be $25.00 or $30.00 a month.

In other words, if customers had to pay for

Waiting, Watching and Working

all of which are accomplished by their electric service.

Suppose the customers had to get a human being to render this service. Suppose they could get a 24-hour servant at $7.00 a week for instance, (and where could you find one like that)—that servant would cost over $28.00 a month. Therefore, if the electric servant accomplishes all this, doesn't an electric service bill of $5.00 or $10.00, or even $20.00, a month, look small in comparison with $28.00 or $30.00 a month? But the customers must be made to see this.

Why not get the customers in the habit of rating themselves according to the amount of electric service of that sort that they use? In other words, the more electric service they use in terms of servant hours, the more modern and efficiently that home is operated—to keep them up with the Joneses!

We can sell the customers up to the idea that $20.00 or $25.00 a month would be cheap for their enjoyment of all the benefits of full electric living. Of course, to reach that point they must buy new appliances, and that's what the sales departments want to have happen.

Changing the Story

How can we go about changing our story from Penny Electricity to Dollar Service? Well, in the first place we can't UNLEARN the generation of people that we have been selling penny electricity for a long period of years. That's the older generation—a diminishing generation.

So, we should start fresh with a new generation. When you are 45 years old, you are one out of four—the other 75 per cent are younger than you are!

We've got to start fresh with our story of today and aim at this 75 per cent market, especially the younger people (the prospects and customers of tomorrow). What do we mean by younger people? Well, let us take one group, what we call the "teen-agers" for instance. Let's remember that *two and a quarter million boys and girls come of age each year as they reach 21 and become voters.*

So, if we aim today's story at this one group of boys and girls now of the ages 17, 18, 19 and 20, we will be reaching 9,000,000 impressionable young people who will be getting married and becoming customers of the electric company in the next several years.

Just think of it, in that one important group alone you have 9,000,000 young men and young women whose thinking itself is looking upward, not downward—and is now in the formative stage!

We can start absolutely fresh with them and sell upward in tune with their thinking, and in terms of *customer benefits.*

But we can't do it, and mustn't do it, with yesterday's method that we used on the older generation. We must give our story the fresh, young viewpoint. Because these young people like all

(*Continued on page* 216)

Utility Power Marketing—Postwar Objectives and Methods

OBJECTIVES

THE basic postwar industrial sales objective of utility power companies is threefold:

1. The retention as customers, in the face of competition from other sources of power and heat, of all industrial customers now using central station power.
2. The sale of power to all industrial plants in the area with emphasis on the full electrification of each plant and the improvement of the competitive position of each customer with its own industry.
3. The sound industrial development of the areas served.

Retention Of Present Customers In The Face Of Competition

At one time or another all electric utilities have faced competition from other power sources. Records of competitive negotiations have shown instances where utility service displaced internal combustion engines where fuel and other operating costs had been phenomenally low. Other records have shown that other power sources having higher operating costs and fixed charges, have replaced utility service. In short, the competitive situation "is governed largely by salesmanship" and "intelligent and continuous customers' service is always the best insurance for its retention and growth." (See An Appraisal of Our Competition, Section II, Report of the Commercial Planning Committee.)

During the war, the power sales organization of utility companies have been of great assistance to industry. Industrial customer relations have seldom been better because of the "intelligent and continuous customers' service" which they have given. Many of our customers, however, have been feeling the effects of restrictions imposed upon them and upon utility companies in the services we normally supply. From now until the end of the war these restrictions may become more burdensome and the manner in which we handle the situation with our customers will largely determine their opinion of us in the immediate postwar period.

How is the utility industry going to attain this objective? Space does not permit a discussion of the merits of various methods used by different utility companies in meeting competition. Chapter IX of the EEI Power Sales Manual, however, gives wholly adequate data on the subject for the use of power salesmen. Careful study of this Manual will equip a salesman to meet a competitive situation but that is only half the job. The other part belongs to sales management.

Sales management has a definite responsibility in the retention of power business. Selling utility power is a far cry from competitive merchandising which ends with a single purchase by the customer. Utility power competes with other power sources each time a monthly bill is rendered. Utility power sales require constant, personal, and helpful customer contact which is not possible when power salesmen are overburdened in the number of customers which they must cover or in commercial office detail. It is management's responsibility to maintain an adequate organization.

From a competitive standpoint, utility management has another obligation in the retention of its industrial business. This is the responsibility of tempering rules, regulations, and rates not only to avoid discrimination, but also, at the same time, to free them from obstacles and restrictions as to the purchase and use of central station service. A customer's power source is but a small part of his plant investment and a customer's power bill is but a small part of his manufacturing expense. Regulations which restrict full use of a customer's capital investment are not looked on with favor.

"Ultimate success in marketing central station power in the years following the war will be measured by the industrial sales programs planned during the coming months and the extent to which these programs are implemented by well trained personnel."

* * *

This discussion of utility power marketing is a chapter from Section IV—Industrial Power Markets—of the Postwar Planning Report of the Commercial Planning Committee of the Institute. Section IV of the Report, available to EEI member companies this month, also contains a discussion of the general industrial trend, a survey of major industries, and a discussion of postwar disposal of government owned factories and surplus property.

The Sale of Power to All Industrial Plants in the Area With Emphasis on the Full Electrification of Each Plant and the Improvement of the Competitive Position of Each Customer Within its Own Industry.

The growth and health of industry in any area is the starting point for expansion in residential and commercial sales of electricity. Part of the utility industry's postwar sales objective, therefore, lies in the assistance which it can render to its customers in lowering the manufacturing or processing cost of its product. If nothing else, the war has taught industry that better production methods can be developed in nearly every industrial plant. It has also taught the utility industry that in most cases these improvements result in an increase in use of electric power for new applications or expanded production.

In some plants the war has restricted the study by utility power engineers of product design and manufacturing methods and in other plants war production has been speeded through their assistance. After the war, however, industry will again compete in the markets for its products. Price and quality will determine sales and industry will welcome assistance from any source.

The utility industry talks of the collateral advantages of its service when compared to isolated plant power supply and other forms of heating. There is a tendency, however, to assume that the customer wants central station power drive or electric heating and needs a few generalized arguments to help swing the balance in the utilities' favor. However, many decisions have been made by isolated plant operators to purchase central station service or by utility customers to install electric heat treating, metal melt-

ing, baking, etc., where a careful investigation would have shown that most of these sales had been made because the collateral advantages could be evaluated in lowering of overall production costs, through the elimination of operations, production delays, direct handling expense, and supervision.

As new power applications become more complex and the production of material tends more and more toward continuous processing with the elimination of physical handling, knowledge of a customer's manufacturing methods becomes more important for power salesmen.

This part of the industrial objective of utility sales organizations can well be summarized in the vital need for more knowledge of customer's plants which will permit a closer coupling of the power salesmen's knowledge of new power applications with customers' production problems. Section XII of the Power Sales Manual — Production Method Analysis for Power Salesmen —provides much useful information on this subject.

Further knowledge of customers' plants will also uncover the uneconomic use of fuels for process heating as well as steam power drive of pumps, air compressors, steam hammers and much other equipment which form a future market for electric power.

The Sound Industrial Development Of The Areas Served

New industries mean more jobs, more commercial, residential and industrial sales and give this phase of promotion an important place in the postwar sales objectives of any electric power company.

One of the main functions of industrial development during this period will be to watch with great care the trends and plans of the industries now located in the territory. The serving of our present industries should be given primary consideration, no matter how attractive the prospects of new industries may be.

Two phases of industrial development are receiving considerable attention in many areas of the country. The first is directed at adding the maximum dollar value to manufactured products which originate in a particular area. This is no doubt a sound approach, as long as the economics in that area are favorable to such a program. The second is the promotion of subcontracting.

War-time production schedules have taught the benefit of maximum utilization of productive capacity within an area. It is reasonable to suppose that a considerable amount of subcontracting will continue after victory is achieved to avoid costly transportation of goods from outside a given area and to increase diversity of manufacturing.

Because of the great war-time dislocations it is more important than ever that utility companies make or revise their surveys of the industrial areas served.

Accurate and current facts on the advantages a community can extend to industry, and the types of industries that it wishes to attract, will be of great value during this period. Surely the question of labor supply for the postwar period needs to be evaluated. The opportunity for utility companies through sound industrial development, to help hold or attain high levels of employment is tremendous. Recognition should be given to the creation of the good will and understanding of the citizens of the communities served where this cooperation is carried on effectively. The Committee for Economic Development can be of great assistance in such a program and the U. S. Department of Commerce booklet "Community Action for Postwar Jobs and Profits" Industrial Series No. 6 also provides some good information on the subject.

In order to carry out a united program during this critical and important period, a utility company's plans should augment the program of other development agencies in the area. The timing of publicity and direct sales efforts to correct or clarify war-time impressions about an industrial area is of the greatest importance. Decisions as to branch plant locations or new product plants will be made before conditions prevailing during war-time production have been corrected.

The field prospects among manufacturers is rather selective, as about 15 per cent of the plants in the United States employ about 80 per cent of the workers. A major responsibility of any industrial development program is the presentation of the facts about a territory to the executives who make the decisions. The most convincing facts that can be put before executives of industry are the reasons why new customers have selected and older customers have elected to remain in a particular area. A survey of present utility will guide promotional efforts and stimulate effective action.

(An excellent outline of the subject "Industrial Development" is available in Section X—Power Sales Manual of the Edison Electric Institute and repetition of those facts in this report is superfluous.)

Are You Ready?

Objectives are fine! They serve to clarify thinking. If more than casual consideration is to be given them, however, analyses and planning are necessary in the development of an intelligent program for their attainment. It is not possible here to present a program equally applicable in all areas but it is possible to discuss various phases of power sales work and the duties and obligations of personnel and management.

METHODS

THE JOB OF SELLING POWER

It is the power sales personnel on which utility companies must depend for increased industrial sales and revenue after the war. For this reason, the hiring of new men, their training and the retraining of present personnel in sales work is of extreme importance. Job analyses obtained from several sources have been analyzed into a representative study in which the qualifications for the work, the duties of the power salesman, and the knowledge which he must ultimately acquire of his customers' plants, are outlined below.

Qualifications for the Work

In order to qualify for work as a power salesman, a man should:

1. Be interested in sales work and have sales ability.
2. Have a pleasing personality and enjoy working with people of all classes.
3. Be equipped with a thorough working knowledge of his company including its organization, policies and practices, obtained through training in other departments or a cadet course.
4. Be a graduate engineer, or equivalent thereof.
5. Be the type of man who is willing to study new engineerig and sales methods.
6. Be interested in industrial economics and processes.
7. Be able to express his thoughts well, talk in public as well as to individuals.

Duties of the Power Salesman

1. Maintain customer service standards by:

a. Preparing and negotiating all contracts with industrial customers.

b. Arranging for service or additional service facilities.

c. Examining customers' bills monthly in an endeavor to anticipate troubles, improve customers' load factor, aid in load scheduling and assure proper rate application.

d. Studying, and provide the customer as-

sistance in testing, plant wiring and distribution systems, motor applications, lighting, heating, welding, etc.

e. Keeping constantly abreast of all new developments through trade literature, and contacts with equipment manufacturers, their agents, salesmen and electrical contractors.

f. Attending meetings of customers' associations, civic clubs and engineering groups to improve customer relations and aid in general knowledge.

2. Retain Existing Business by:

a. Maintaining good customer relations from the top-down, or the bottom-up with all of the customer's management and operating personnel. Knowing and working with the right men in a customer's organization cannot be emphasized too strongly when it comes to competitive power service negotiations.

b. Aiding customers in the most effective use of service.

c. Keeping customers sold on the value of service through regular customer contact.

d. Elimination of waste—electric energy and heat—throughout the plant.

e. Rendering technical assistance toward lower manufacturing and processing costs.

Note: Business is retained most successfully by activities carried on months and years before competition may arise.

3. Obtain New Business by:

a. Making sales reports for the purpose of supplanting a prospective customer's other power source.

b. Recommending and selling new electric power applications or controls which will increase production or reduce manufacturing costs.

c. Selling existing customers on more complete electrification through the replacement of steam drives on pumps, compressors, hammers, etc., and the replacement of oil, coal, or gas for process heating.

d. Giving assistance on industrial development work to Chambers of Commerce, industrial realtors and other interested parties.

e. Promoting subcontracting where desirable to assure continued good business and full utilization of plant facilities in their own territory.

f. Making necessary market analyses to aid sales promotion in the territory.

Knowledge of His Customers Which a Power Salesman Should Ultimately Acquire

1. The economics of the businesses of his various industrial customers and prospects together with their place in their respective industries.

a. The classification and type of products.
b. Major processes and methods used.
c. Alternate processes and their comparative economics.
d. Other products possible with slight process modification.
e. Markets for the products.
f. Raw material sources.
g. By-product and waste disposal.

2. The relationship of power to production.

a. Characteristics of the load.
b. Economical hours of daily and monthly operation.
c. Ratio of power cost to total production cost.
d. Ratio of kilowatthours to man-hours required.
e. General relationship of process steam requirements to the electric load.

3. General Plant Conditions.

a. Lighting.
b. Materials handling.
c. Ventilation and air movement.
d. Heating system.
e. Water supply system.
f. Sewage disposal.
g. Compressed air.
h. Electric distribution.
i. High and low pressure process steam.
j. Other process heating.

4. Manufacturing and Processing Methods.

a. Hand operations.
b. Automatic operations.
c. Assembly operations.
d. Storages of materials.
e. Inspections.

ORGANIZATION AND MANAGEMENT

Necessarily, the operation of a power sales department is dictated by the geographical area served and the commercial organization of each utility company. Consequently, it is impossible to set up a typical department which would serve all utility companies equally well. The relative advantages or disadvantages of the specialist type of organization as compared with the more general type in which a single individual is responsible for all industrial engineering as well as commercial contacts with the customers assigned will also be determined by the area served and management preference.

No matter which type of organization is used, however, management cannot afford to overlook certain of its responsibilities regarding its sales personnel and organization. In order to fulfill postwar sales objectives as outlined it should—

1. Maintain a sufficiently large organization to permit the development of sound and cordial customer relations, particularly with those customers that may be attracted by competition to other power sources. In the face of declining revenues in the immediate postwar years, the enlargement of sales organization may seem difficult, but such a step will probably be necessary as a part of any forward-looking program. Again, sound relations depend on customers' service.

2. Authorize and encourage the careful study of customers' production methods and processes and insist on thorough knowledge of customers' plants and problems. The amount of time spent in a customer's plant is again a function of the size of the sales organization.

3. Eliminate all unessential commercial office detail assigned to members of the power sales department, so that the maximum amount of their time will be available for effective sales contacts.

4. Provide power sales organizations with adequate and effective tools to do the job. These sales promotion aids should include:

a. A continuous educational program designed to keep power salesmen abreast of changing markets and the equipment available.

b. Adequate information on company policies, rules, regulations and service classifications.

c. The EEI Power Sales Manuals, Competitive Power, Lighting, Electric Heating and other pertinent manuals.

d. Data on new processes and new developments including access to trade and industry magazines.

e. Access to testing facilities in a company owned or private laboratory where new processes may be developed or existing methods tested.

f. Membership in civic organizations and engineering groups, etc., where these organizations are active and can be of assistance.

g. Adequate back-up of sales efforts through direct mail advertising and such publications as Electrified Industry.

5. Assure opportunities for the assumption of greater responsibilities within the utility company by power sales personnel. Such opportunities will attract new personnel of high caliber and at the same time act as a stimulant to the present organization.

6. Provide for the training of new personnel and the retraining of present personnel in power sales technique and the necessary background information and data on electric power application. The responsibility of management in power sales training is among the first in importance at this time because of existing plans of many companies to hire new men and in view of the fact that little actual sales work has taken place during the war. For those reasons the following paragraphs are devoted to the subject.

Training Personnel

The training of new personnel and retraining and refresher work for present personnel are closely allied. Experienced salesmen benefit from a review of sales methods and technique. This will be especially true in the period immediately following the war.

The problem of sales training for industrial power and heating work is a problem which is partially solved. The EEI Industrial Power and Heating Committee commenced some years ago to provide the necessary training tools and facilities. This committee has agreed that sales training for industrial power and heating work consists of two specific items:

1. A basic sales training course.
2. Specific training in power sales work.

The first, or basic sales training course, should consist of the fundamentals of sales work. The preparation of such a course has been proposed by the EEI Sales Training Committee and it is hoped will be available before the end of 1945.

For the second, or specific sales training course, the information or background data has been prepared and is in the EEI Power Sales Manual. The subjects covered in this manual are as follows:

1. Power Sales and the Power Salesman.
2. Electric Furnace Equipment and Application.
3. Cooking and Baking; Stills and Sterilizers; Midget Heating Devices.
4. Infra-red Heating.
5. Industrial Lighting.
6. Commercial and Industrial Refrigeration.
7. Commercial and Industrial Air Conditioning and Ventilation.
8. Adequate Wiring.
9. Competition.
   - Diesel.
   - Gas Engine.
   - Steam Engine and Turbine.
10. Industrial Development of Territory.
11. Electrical Uses in the Petroleum Industry.
12. Production Method Analysis.
13. Induction Heating.
14. Electric Welding.
15. Materials Handling.
16. Motor Application and Control (in preparation).

The Industrial Power and Heating Committee is now preparing the proper lesson plan and instructors' guide for this specific training course. The completed course should be available before the end of 1945.

To these two courses utility companies will wish to add manufacturers equipment application courses and their own cadet or training courses in the operation and work of their particular companies to provide a well rounded educational program for their new power salesmen. The importance of a thorough grounding in the policies, practices and organization of the power salesman's own company cannot be over-emphasized.

The competitive aspects of postwar sales and the wealth of technical information in which a power salesman must be well grounded make such a training program imperative.

Conclusion

Carefully planned industrial sales programs will be the basis for the postwar marketing of central station power.* The preparation of these programs will require a review of present organizations, and a study of the responsibilities assigned.

Central Station programs must include provisions for adequate customers' service, market analyses, studies of customers' manufacturing and processing methods, and industrial development work.

In many instances it will be found necessary to increase the power sales personnel. New men must be selected from other departments, from returning service men, from industry, and in later years from engineering graduates.

Care in selecting and training men cannot be over emphasized. A good power salesman is an unusual combination of a salesman, engineer, and a business man. He attains a position of responsibility in any company and his work contributes greatly to residential and commercial business as well as to industrial sales.

Ultimate success in marketing central station power in the years following the war will be measured by the industrial sales programs planned during the coming months and the extent to which these programs are implemented by well trained personnel.

*Continued planning in the industrial power field is essential to the maintenance of electric power sales and revenues. To this end the plans of equipment manufacturers are most welcome—for example: The More Power to America program of the General Electric Company should be of help to many utility companies in appraising their future markets and sales. In this program the General Electric Company has set up an objective of increasing by one kilowatthour, the kilowatthours per man-hour used by industry in the first four years after the war. Fulfillment of this objective on a nation-wide basis will require increased electrification of industry, the development of new production methods using electric power as well as the installation of automatic control equipment which will put more electric power under the control of each worker.

Consolidated Edison Releases Market Survey

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC., has released a comprehensive study of the economic life and the living and buying habits of New Yorkers in the four major boroughs of the city — Manhattan, Bronx, Brooklyn and Queens. Entitled "Survey of the New York City Market," the book contains 124 pages and has 63 charts, 83 tables, and 87 maps.

The market survey, the company stated, was prepared to help every business with a product to sell or a service to render in New York City. It is for the use of department stores and those dealers merchandising electric and gas appliances, as well as retail stores, chain stores, banks, real estate businesses, insurance companies, manufacturers, newspapers, advertising agencies, and utilities. It can be used as a foundation for market analysis to determine the location and degree of buying power, outline sales territories, set sales quotas, check sales efforts, allocate advertising expenditures, and to locate stores or other types of business.

Much of the information in the survey, it was explained, has been compiled in connection with the company's studies of the make-up and development of the city for use in planning future requirements of electricity, gas and steam.

The data, organized and presented in graphic form, were obtained from various sources including the U. S. Census of 1940 and local agencies. The company made its own survey of the location and number of six different types of retail stores. In most cases the data are presented by "census tracts," which is the unit used by the Census Bureau. There are 3343 census tracts in the city.

The market survey is divided into five parts, the first of which covers New York City as a whole, while the other four sections deal with the Boroughs of Manhattan, Bronx, Brooklyn and Queens separately.

The survey shows the distribution of New York City's manufacturing by industries. Population is classified by race and nativity and by age groups, and under employment, the survey gives a breakdown of the industry groups local residents work for and the jobs they work at.

Particular emphasis in the survey has been placed on housing because the type of dwelling in which a family lives determines many of its most important expenditures.

For each of the 3343 census tracts in the four boroughs of the city surveyed, the book gives the number of residential structures, the number of dwelling units, the number of one and two-family houses, the number of owner-occupied homes, the number of dwelling units built before 1900, the number needing major repairs, the type of heating and the fuel used, and the number of mechanical refrigerators.

The number and location of the following six types of stores are given for each of the four boroughs: food stores, eating places, wearing apparel, general merchandise, drug stores, and home furnishings.

Four separate colored maps are issued with the survey, giving the average monthly rent for each of the 4000 city blocks in the four boroughs. Rent paid is claimed to be the best index of purchasing power that can be obtained.

Emergency Service Restoration

By L. R. Gaty
Philadelphia Electric Company

Presented before EEI Transmission and Distribution Committee Meeting, Cincinnati, Ohio, May 15, 1945

THE Transmission and Distribution Committee has been requested by the Engineering Division General Committee to make a study of the problem of restoration of electric service after widespread disruption of transmission and distribution lines.

The two hurricanes along the Atlantic Seaboard following within a few years of each other and resulting in widespread customer outages, initiated a good deal of public concern and some newspaper publicity. There are atmospheric conditions other than hurricanes which also may result in widespread outages. These include severe sleet storms, floods and wind storms of less than hurricane intensity.

There is a widespread feeling that customers have been more tolerant of service outages during the war than they will be after the war. Many of them appreciate that we have lost considerable manpower, that we are restricted in our ability to make improvements, and that materials are unavailable. However, when these restrictions are lifted and manpower and material again become available the customers will probably become more critical. This is particularly true as the electric load is expanded and additional appliances and devices are added by the customers. The more electric appliances they have the greater dependence must be placed in our service. This additional load carries with it an obligation on our part to assure them of reliable service.

A customer who is dependent upon electric service for the operation of his oil burner or coal stoker, range, water-heater, refrigerator, home freeze, water pump, lights and radio becomes pretty helpless if the service is interrupted for any length of time. An outage of half a day or more in cold weather may become a catastrophe and make his house uninhabitable. In addition, when the rural customers are considered who may have milkers, milk coolers, incubators, brooders and other farm devices in addition to those previously listed, a very heavy financial loss may be suffered. The more complete the electrification of a home, farm or industry becomes the more important it is to assure the customers that the service will not be unavailable for extended periods.

With the exception of those companies that have been unfortunate enough to suffer severe and widespread damage in the past few years, many feel that they are doing a good job in maintaining service and that there is little problem in their area. However, the fact that an emergency does not occur frequently makes it more necessary to anticipate that once in five years or once in ten years we may be called upon to repair quickly severe damage to an extended area. It is not enough to say that such an occurrence is an act of God and cannot be anticipated, and that the customers who are out of service for two, three or four days are unfortunate but beyond our help.

Another example of the thought being given to this subject by organizations outside of our field is shown in an article entitled "Interruptions of Electrical Supply to Water Works Plants" by A. C. Hutson, Assistant Chief Engineer, National Board of Fire Underwriters, presented at the New Jersey Section Meeting on November 4, 1944, and published in the Journal-American Water Works Association for January, 1945. This article cited many major outages to communities during the past few years involving generating station, substation, or transmission line failures. During the outage many of these communities were without water and, therefore, without fire protection. In conclusion the following statement is made: "None of the instances cited is so old as to permit one to say that similar events cannot happen with modern electric supply systems. . . . The most complete interconnection of basic high voltage power lines does not seem to produce the answer. Other sources of power, primarily internal combustion engines, and greater storage deserve attention."

Still another indication that other thought is being given to our problem is a survey questionnaire recently sent out to a large number of home owners by a research organization. The purpose of this Residential Market Survey is to develop a base of factual data upon which to gauge the market for Household Electrical Generating Equipment. This would be a 7½ kw internal combustion driven generator to sell for not more than $750. The unit would be installed in the cellar, would be 4 ft long by 2 ft wide by 3 ft high and would be automatic starting and have fuel for five hours operation with supplementary storage available. The life was estimated at 25 years, which would result in a capital cost of only $2.50 per month. However, this would result, for the average residential customer, in fixed charges a little over 2½ cents per kwhr and with operating and maintenance charges would probably represent rather high costs per kilowatt hour.

We have been asked to study the problem and to make recommendations back to the Engineering Division General Committee regarding future plans. I would like to run over very briefly some of the problems as I see them and some of the steps which may be taken to improve service reliability.

The promptness with which service can be restored is not a direct function of the number of customers interrupted. As the volume increases it reaches a point where the efficiency of the organization decreases and the interruption time is extended. If we can reduce the total number of customers interrupted in any given storm we will restore service to all customers far more quickly and will, therefore, reduce both the number and the intensity of the complaints and minimize the adverse publicity.

In our study of this problem careful consideration should be given to the methods available for reducing the total number of faults. An examination of

the damage resulting from severe wind storms and from sleet storms shows that practically all faults are caused by tree failure. The pole and wire plant will withstand almost any wind storm and a fairly heavy sleet storm. However, they will not stand up under broken limbs and heavy trees. There are three methods which may be used to reduce the number of tree faults. One is by obtaining adequate tree clearance as differentiated from merely obtaining tree trimming. In some locations adequate clearances can be obtained which will give reasonable protection to the lines. In other places it is difficult to obtain even minimum trimming permission. Another possible solution is to locate the line away from the trees by obtaining private property rights behind the trees adjacent to highways. Again this is entirely feasible in some locations whereas in others it is out of the question. The third method is to use storm-proof construction, such as aerial or underground cable. At the present time various types of aerial cable are available from the manufacturers, but none of them are entirely satisfactory for general use. There is undoubtedly a very broad field for storm-proof, self-supporting aerial cable and any manufacturer who makes available a satisfactory cable at a reasonable price will do the industry a real service and will be able to sell large quantities.

Attention should be given to the supply transmission lines to substations to make these as reliable as possible. From the substation the major attention should be given to the main part of the circuit where a fault will result in an interruption to a large number of customers. If the main portion of the circuit out to the load center can be made storm-proof the number of customers interrupted will be reduced, the number of customers per fault will be reduced, and the repair time will be decreased since lighter construction will be involved.

The reliability of open wire construction can be improved by increasing the spacing between conductors. Tests were made in Philadelphia about ten years ago on 14½ inch and 29 inch spacing. These indicated that an arc once established on the 14½ inch spacing will be maintained until the circuit is interrupted, but on a 29 inch spacing this arc was frequently self extinguishing. Interruption records of circuits also showed conclusively that there was a substantial reduction in wire failures and circuit outages on circuits having a 29 inch spacing. A program was started to increase the spacing on all 4 kv circuits and has now been practically completed. The results have been highly satisfactory.

Another method of reducing circuit outages is to have available an alternate means of supply for the major portion of the circuit. As an example, two lines from a substation over different routes may be tied together beyond the center of distribution through a switch or set of cutout boxes which is normally open. With the use of sectionalizing boxes in the circuits this will permit restoring service to a large proportion of the customers even though a failure occurs on the main portion of one of these circuits. When load density and conditions permit this can be expanded so that there is more than one breakdown to the main portion of the circuit and so that many of the branches have breakdown service available.

Adequate dispatching facilities and personnel are necessary to handle a major storm. Normal facilities may become so badly jammed that the service restoration work is seriously slowed down. Thought should be given to temporary facilities or to a generous installation of permanent facilities to provide for peak loads caused by exceptionally severe storms.

Adequate and rapid communication is essential in all cases. Lack of communication means many hours lost in the field traveling to and from communication centers. These same storms disrupt telephone service so that frequently it is necessary to travel many miles to communicate with the central dispatching office. Two-way radio is a solution which should be available again in the near future, and which should result in a great speedup of service restoration. A complete and adequate two-way radio communication system could very easily pay for itself in one severe storm by the manhours saved. In addition daily benefits are obtained in reducing interruption time, increasing safety, improved public relations, and savings in maintenance manhours.

Progress of the construction crews has been slowed down very seriously by blocked roads after some of the heavier wind and sleet storms. Advance discussion of this problem should be held with the local police, the state police, the forestry association, if there is one, and local tree clearing organizations, so that roads can be cleared up as rapidly as possible. This will expedite locating and clearing the faults in the area.

Consideration should be given to the formulation of a set of operating instructions by each company outlining the steps which should be taken in the event of a severe emergency and the delegation of authority and responsibility. This may be quite brief in some cases and quite extensive in others. An excellent example is the one prepared by the Boston Edison Company and presented at the February meeting of the Committee. This one has the further advantage that it was developed following the first hurricane in this area and was used and found to be very valuable at the time of the second hurricane. The details of this procedure will not be reviewed here, but it should be used by the Committee as a model which has gone through a baptism of fire.

The function of the national committees is primarily to collect and make available information on what individual companies have done with respect to a particular subject that appears to be of interest to a substantial number of companies. This problem of storm damage affects such a large part of the country that our committee can well afford to concern itself with making available information on the broad problem. There is little doubt that there is a problem and further study will probably indicate that some reasonable steps can be taken to improve the situation, and that it will be helpful to the industry to acquaint other industries and the public with the fact that the matter is receiving engineering study. What specific measures may be found to be appropriate will undoubtedly vary with individual local conditions and will naturally be finally determined by the individual companies. It does seem clear that there is a problem of real national interest and that the Transmission and Distribution Committee is the appropriate group to study this problem and to make any necessary recommendations that are indicated by such a study.

A subcommittee will be appointed which will be responsible for this activity. I solicit your consideration of this problem and your cooperation with the subcommittee to assist them in getting a solution which is fundamentally sound.

A Public Utility Credit Policy

A Joint A. G. A.-E. E. I. Customer Activities Report

By J. Gordon Ross

Rochester Gas and Electric Corporation, Rochester, N. Y.

Chairman, A.G.A. Customer Relations Committee

THE sale of public utilities' services is essentially credit business. Accounts are opened, service made available and later, after meter readings are taken to determine the extent of use, bills are issued and payment is anticipated. In this respect utilities are not unlike other retail credit businesses which may decline to accept an account, whereas utilities may seek to protect themselves against loss by obtaining a security deposit from an applicant whose credit standing is unsatisfactory.

Need for Established Policy

Other retail businesses obtain applications, make credit investigations and establish procedures to govern the opening of accounts, credit authorization and collections as part of their so-called credit policies. The procedures are similar in most retail businesses and they are quite generally known to the credit-seeking public. It seems logical, therefore, for public utilities also to have credit policies embracing applications, deposits and collection procedures which, because they are similar to and not unlike those of other retailers, would be known and understood by our customers and those who seek our services. This need is even more essential when, in addition to selling gas and electricity, we engage in the sale of appliances, coke, repair services, or a dealer cooperative sales plan involving credit responsibilities of the purchasers.

The demands for our services are so universal that some utilities seem to have felt there is no need to change their policies. Even now we find those who decline service until the residential applicant has made a personal call at their offices to sign a formal application and pay the "customary" deposit. On the other hand, we have those utilities who take no deposits whatever from residential customers, and they neither require nor accept a customer's signature.

Data accumulated in this study seems to support the "middle of the road" policy of securing reasonable information about a new customer, accepting his signature if he calls at the office, and requiring a deposit only when he is known to have an unsatisfactory record. Such a policy makes it possible to establish a record that will enable the utility to know the customer and consequently to apply intelligence and good judgment in subsequent transactions involving credit purchases or delinquent accounts.

First impressions are lasting, and this should be borne in mind in connection with the greeting of new customers. If there is a receptionist, or if others first contact the newcomer, it goes without saying that he should be graciously approached and properly directed to the service representative who will care for his needs. The confidential nature of this interview requires that it be handled in privacy, rather than at a congested counter where others may overhear. Indicative of the trend in this direction is the fact that 61 per cent of the 18 companies recently surveyed accept applications at desks only; 28 per cent accept them at both desks and counters, and only 11 per cent at counters only.

The next consideration is the questions to be asked. Some may feel it to be adequate to ask only the applicant's name, what he wants, and where he wants it. This would scarcely be sufficient to establish a record of the customer that would be of any assistance at a later time. On the other hand, a customer may become annoyed by being required to answer unnecessary questions. Certain fundamental information will be given by the average applicant without offense because it is what he would customarily give to any store from whom he was seeking credit. Obviously we must know his name, where and when service is desired, and other essential information to make it possible to provide the service desired. This information is routine and the name, of course, should be in full, that is, given name, middle initial and last name. Justification for this lies in the fact that we have so many customers with similar names that we must avoid confusing the accounts.

Other questions are asked to a varying degree by most utilities for purposes of further identification of the applicant, to facilitate credit approval, and to, if need be, assist in the collection of the account. For instance, 77 per cent of those surveyed ask the applicant's former address, 77 per cent ask if he had utility service account there, 44 per cent ask the name of the utility which served him, 66 per cent ask his place of employment, and 60 per cent his occupation.

Less frequently asked are the wife's name (33 per cent), how long at former address (33 per cent), badge number of employee (22 per cent), and trade references (22 per cent).

If a customer returns to a locality it is the practice of 72 per cent of the companies to ask the same questions as on the first contact, except that two companies do not repeat if the customer returns within a year. Two companies do not ask any of the above questions unless the customer desires to attempt to establish credit "in lieu of placing the customary deposit."

Obtaining Applicant's Signature

The matter of obtaining the applicant's signature does not seem to any longer be considered an absolute rule. Only 66 per cent report that the signature is required or accepted, while 33 per cent presumably do not get it at all. There are those who contend that the signature adds weight to the original transaction, and, as it inflicts no hardship on the applicant, it should be accepted. The psychological effect of so doing is good, whereas to relax a requirement in this respect is apt to create the impression that it would not be difficult to obtain service under false pretenses.

Applications are accepted by telephone by 88 per cent of the companies surveyed. Twelve per cent do not accept applications by phone, but ask their prospective customers to come to the office to apply. Of those who do accept applications by telephone it is of interest to note that an average of 53 per cent of all residential applications are received in this manner, with one company receiving 73 per cent by phone. When telephoned applications

are received by those who normally require signatures they are usually obtained by the turn-on man or by mail.

More than half of the companies responding endeavor to obtain applications in the name of the head of the family, although many will accept the wife's name if requested. All but one company accept requests for transfer of service to a new address by telephone.

Experience in the retail credit granting field has proved that better than 98 per cent of the people are honest and it is not necessarily found that the percentage of dishonest people is greater in any particular locality. Yet it is surprising to learn that 28 per cent of the companies reporting require deposits from most residential customers, with one company requiring deposits from all except property owners with good credit standing. Thirty-three per cent require deposits from most applicants for service moving into certain areas or districts presumably where collection experience has been bad. All but one company (which does not accept any residential deposits) require deposits when they *know* an applicant's credit is unsatisfactory, and 44 per cent require deposits when they are uncertain about an applicant's credit. On the other hand, 66 per cent give service without deposit to *most* residential customers, and 50 per cent do not ask deposits unless they know applicant has a poor credit record.

As a means of determining the credit standing of an applicant 39 per cent of the companies send inquiries to the utility which previously supplied the applicant, but two of them only do this if the previous supplier was a branch or affiliate of their own company.

Seventy-seven per cent of those reporting refund deposits after a satisfactory record of payment has been established, usually one year. Of those who do not have such a plan, one company retains deposits until service is terminated. In 83 per cent of the companies deposits are accepted by the person who accepts the application, while the others apparently refer the customer to some other person or department for this purpose.

The requirements of a deposit often subjects a new applicant to hardship or at least inconvenience at a time when he is usually confronted with the expense of establishing himself in a new residence. Such a condition may cause him to have an unfavorable if not definitely hostile, attitude toward the particular utility involved, and perhaps utilities in general. Furthermore, a comparison of the actual net loss due to bad debts of a company having a liberal credit policy with those of a company requiring deposits from most customers may show surprisingly little difference, if any. If this is true, the rigid "deposit demanding" company is not only building ill will for itself and the industry, but is paying unnecessary interest charges and maintaining unnecessary deposit records and reports.

Standard Credit Application

The so-called standard credit application used by most retail stores has, in addition to the customer's name and address, some 33 questions of a highly personal nature concerning the applicant. In the utility field it seems that the *maximum* is about nine questions other than those having to do with the service characteristics and the plans for making it available. It would seem to be a fair conclusion, therefore, that rather than causing offense by being too inquisitive about our new customers, we have a tendency to be not sufficiently interested in them to obtain the information that will enable us to classify them from a credit standpoint. Consequently, without such classification, all delinquents are subjected to a routine collection procedure which in itself is a source of irritation and a deterrent to good customer relations. Furthermore, if we engage in appliance or coke sales business and do not maintain suitable records to classify those who seek to purchase on credit terms, delays in credit authorization create a lack of desire to deal with us.

While some localities have a large transient or floating population, this is not the usual thing. A high percentage of our customers remain permanently in the same community. Therefore, the establishment of a proper record in these cases, supplemented by actual experience with them in matters of credit purchases or collection activities, is not a difficult job and it does enable the utility to more effectively serve its customers.

Policies and procedures governing credit extension and collection activities have a far-reaching effect on customer relations. It is therefore of prime importance that we recognize and avoid those things that create antagonism. Those who seek utility service will answer reasonable questions and sign an application without offense if the contact is diplomatically and cordially handled. As these things will help to serve him better, it seems wise to obtain them. On the other hand, we may be assured of resentment on the part of the applicant whom we greet coldly and from whom a deposit is demanded because "it is the policy." Equally offensive will the customer find a collection procedure which requires that a final notice be sent whether the bill be $3.00 or $50.00, and the customer a squatter in the shack by the river, or a railroad president on the Avenue.

Loose Policy Breeds Disrespect

The exercise of caution is also needed to prevent a shift too far to the other extreme. A loose policy, having only as its objective the desire to create good customer relations, may have the opposite effect because of the loss of respect for the utility by its customers. There are situations where it is wise to request an applicant's signature and where a deposit should be required. Evidence of this lies in the use of fictitious or improper names to an extent far greater than seems to be realized. For instance, two large companies recently found that about 30 per cent of their recoveries of bad debts was from customers who had used fictitious or misleading names when applying for service. Firm and vigorous action is needed to combat this practice. The great diversity of charge-off percentages, unaccounted for by usual factors, gives reason to feel that collection policies in some cases lack sufficient firmness to create respect for the rights of some utilities. Hence, it may be concluded that our success from a customer relation's viewpoint in matters of credit and collection must, to some degree, depend on the customers' respect for the soundness of our policies.

Utilities have available the same facilities for obtaining credit information about present and prospective customers as do other retail establishments. In most communities local credit bureaus are well organized and managed. They play a vital part in the credit consciousness of all customers and are worthy of the support and cooperation of utilities. Fear is sometimes expressed that credit bureaus make too many demands for information from utilities. Their successful operation, however, depends on the completeness of their information and many utilities have found it possible to work out a plan with the bureau which would provide all necessary information without the burden of unfair expense or interruptions to routine operation. In some cities utilities provide the credit bureau with the names of all newcomers to their

respective cities, whereupon the bureaus immediately obtain credit reports from bureaus at their former locations. Such cooperation helps the bureau, the local merchants, the utility, and frequently the customers as well.

The use of inquiry cards between utilities themselves is another source of information which is helpful. It is found, however, that some utilities are reluctant to answer such inquiries, presumably because they have not maintained records from which the answers are quickly and easily obtainable. If a customer's record has been good it is a matter of courtesy to him that the inquiring company be told about it. On the other hand, courtesy and cooperation with the inquiring utility should cause it to receive a prompt report in regard to an unsatisfactory credit risk. It is to be regretted that all utilities are not able to cooperate in this respect.

It goes without saying that if utilities are to have credit policies comparable to those of other retail business, they must have credit men with the required training and ability. This means that they must know how and where to secure needed information and be able to apply good judgment to all credit and collection operations. Their value will be enhanced by contact with other credit and bureau men at the meetings sponsored by the credit associations. Here, also, they will be able to dispel the common belief that with utilities it is simply a case of securing *all* accounts by deposit and immediately suspending service to *all* delinquents.

The fundamentals of a credit policy for utilities would therefor seem to be:

a. Greet your prospective customer cordially. Interview him privately.

b. Ask sufficient questions to permit you to know those things you should for your mutual interest.

c. Accept his signature on his first application if you wish. Don't demand it because of "policy."

d. Don't ask for a deposit unless you know his credit standing is unsatisfactory.

e. Allow service to be made available at once, even if further credit investigation is to be made.

f. Establish a record that will enable you to know your customer so you can authorize credit sales promptly and refund deposits automatically when experience justifies this action.

g. Use your customer's record as a basis for collection action on delinquent accounts, thereby assuring the type of action each account should receive.

h. Patronize and give wholehearted support to your local Credit Reporting Agencies. Use other credit information channels freely.

i. Have your credit man become active in your local Credit Associations. The benefits should be mutual.

Credit is used in retail business as a service and convenience to customers, and it seems that utilities should look upon it in the same light. Retail credit policies are based on constant research and long experience. Utilities have likewise had long experience and done considerable research, but the results are not shown in uniformly improved credit technique. The results in other retail businesses have shown policies to be fundamentally sound. Application of similar policies in the utility field should have comparable results.

As we begin a new era of business expansion with the end of the war it appears that more favorable customer reaction will result from policies that are like and not different from those generally used. *In the last analysis, there seems to be no reason to be different unless we can be better.*

Clapp Awarded Marston Medal

PAUL S. CLAPP, vice president of the Columbia Gas and Electric Company and a former managing director of NELA, was accorded the Marston Gold Medal Award of Iowa State College, Ames, Iowa, at the commencement exercises, June 15. He graduated there in Electrical Engineering in 1913.

The Marston Award is conferred each year on a graduate of Iowa State College in recognition of outstanding achievement in engineering, broadly interpreted to include not only those engaged in technical design and construction, but also engineers who plan, develop, and manage enterprises in manufacturing, utilities, and civic betterment. Achievement in engineering teaching and research also receive full recognition.

The Board of Award, besides four alumni, included members representing the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, American Society of Civil Engineers, and the American Institute of Chemical Engineers.

Mr. Clapp has held executive positions with various utilities related to the Columbia Gas & Electric System for the last 12 years. He was managing director of the National Electric Light Association from 1926 to 1932. He has the distinction of active participation in the engineering work which culminated in the opening of the nation's first transcontinental telephone service in 1915. Following World War I, he served on the engineering staff of the Allied Peace Commission, Paris, and was in charge of the re-establishment of telephone and telegraph communications throughout Central and Southeastern Europe with headquarters in Vienna. While assistant to Herbert Hoover, then Secretary of Commerce, he was Secretary of the St. Lawrence Commission of the U. S.; Secretary of the 2nd National Radio Conference, and directed the "Northeastern Super Power Survey."

Puget Sound Company Again Wins Report Contest

THE annual award for the Electric Light and Power Company producing the best annual report has again been won by the Puget Sound Power & Light Company of Seattle, Washington, judges of the yearly contest have announced. In producing the best annual report for the year 1944, the Puget Sound Company has repeated its performance of the year 1943. The prize is a handsome bronze plaque.

Objects of the competition are to encourage the clarification of annual reports, in order that the average stockholder can read and understand the year's business operations of a company. To qualify in the contest reports must be in simple language, must dramatize accomplishments and build good-will.

The winning report consisted of a fifty-page bound booklet with a two-color cover, montage end papers, and a text with numerous charts, graphs and photographs.

In making the award to the Puget Sound Power & Light Company, the judges declared:

"This report is well illustrated, attractively printed and presents its major points with dramatic emphasis. It presents statistics in streamlined form and further illustrates significant statistical data with charts and graphic devices.

"The inclusion of representative institutional advertising helps to give the stockholder a well-rounded conception of the year's activities. The body of the report is written with uncommon clarity and forthrightness."

(*Continued on page* 211)

BUSINESS MANAGED ELECTRIC POWER COMPANIES' BALANCE SHEET

Representative Years in Two Wars

1917 FIRST WORLD WAR	1944 THIS WORLD WAR
Number of customers in 1917 was 6,200,000	Customers in 1944 reached 28,000,000
(Almost 5 times as many)	
Kilowatthour consumption for each home was 268	Kilowatthour consumption for each home was 1,151
(An increase of more than 4 times)	
Kilowatthours produced for each kilowatt of capacity was 2,900	Kilowatthours produced for each kilowatt of capacity was 4,696
(A 1944 kilowatt produced 162 per cent of a 1917 kilowatt)	
The electric power companies in 1917 had productive capacity of 8,411,944 kilowatts	The electric power companies in 1944 had a productive capacity of 39,734,753 kilowatts
(Productive capacity up 372 per cent)	
Kilowatthours generated came to the total of 24,398,983,000	Kilowatthours generated came to the total of 186,509,000,000
(Power supplied to the nation up 664 per cent)	
Out of each earned dollar the sum paid in taxes was 6.43 per cent	Out of each earned dollar the sum paid in taxes was 23.8 per cent
(Ratio of taxes to operating revenue increased 270 per cent)	
Average price per kilowatthour used in the home was 7½ cents	Average price per kilowatthour used in the home was 3½ cents
(Cost of electricity in home less than half that of 1917)	
Taxes paid by business managed electric power companies were $29,897,100	Taxes paid by business managed electric power companies were $703,000,000
(Taxes 23½ times greater than in 1917)	
Some power shortage in two areas	Power produced met all needs
(Still leaving a surplus capacity)	

This page was prompted by a recent advertisement of the Association of American Railroads comparing record of the railroads in the First and Second World Wars.

Some Observations on Subtransmission System Economics

By D. K. Blake
General Electric Company

Paper presented before Engineering and Operating Section, Southeastern Electric Exchange

THE subtransmission system is usually thought of as that part of the high-voltage system that supplies the distribution system. It is a combination of transmission and distribution. It does both. It transmits and it distributes. The exact dividing line between transmission, subtransmission, and distribution does not concern us in these observations.

Subtransmission economics do not permit the same degree of generalization as do distribution economics. The reason is that the load units (or units of expenditure) are so much larger and fewer in number that the law of averages does not apply. Some particular, unusual circumstance can have enough influence to offset the influence of the normal circumstances. In distribution, the so-called normal conditions predominate, so that a relatively few unusual circumstances are lost in the over-all picture.

The economic substation size supplying subtransmission systems can be analyzed along the same lines used to determine distribution-substation sizes. In either case, the problem involves the balancing of three major cost elements: i.e., HV lines + substations + LV lines. In distribution, the HV lines may be 13.8 kv; the substations, 3000 kva; and the LV lines, 4 kv. In subtransmission, the HV lines may be 69 kv; the substations, 20,000 kva; and the LV lines, 13.8 kv.

The material being presented in this paper is taken from studies made in an effort to better understand the principal factors that determine the most economical combination. For that reason, the problem has been oversimplified. This simply means that many factors have not been considered. Oversimplification enables one to see how the principal variables influence the result. After the answer is determined on a simplified basis, it is obviously possible, then, to bring in the left-out factors—to see how they may or may not change the result. Experience has shown that putting in all the cost factors in one comparison gives the answer, but does not make it easy to tell why the answer comes out the way it does. So, in this paper, we are more interested in the "why" of the answer. The answer, of course, is of interest too, but still is not applicable beyond the circumstances and factors included.

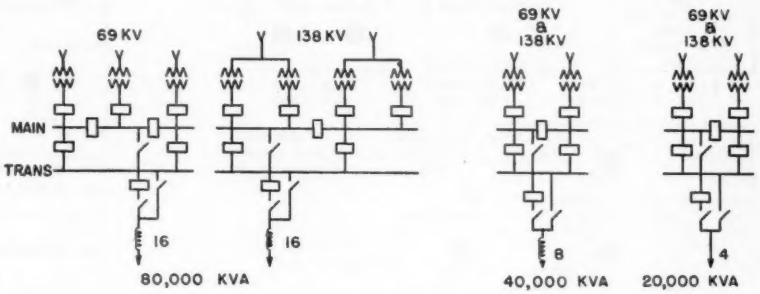

Figure 1

The principal assumptions are:

1. 13.8 kv, 69 kv, 138 kv
2. No real estate
3. No operators
4. Distributed load
5. 1250 kva/square-mile load density
6. R/W cost of 69 and 138 kv = $2500/mile. None for 13.8 kv

In Fig. 1 are illustrated the three

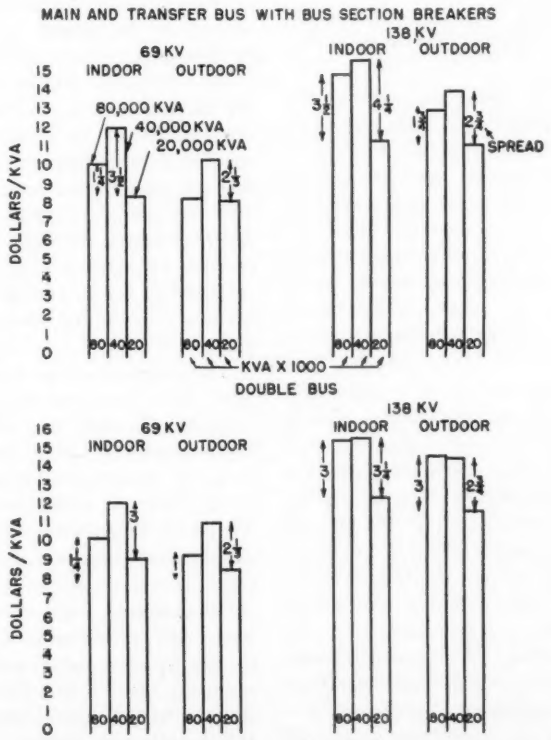

Figure 2

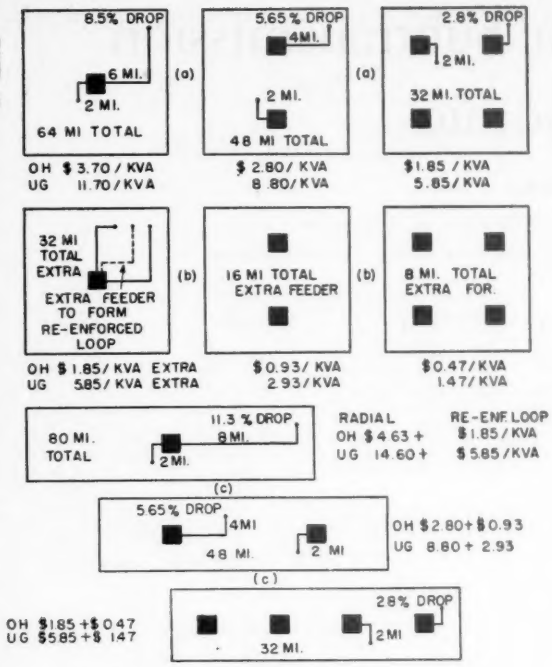

Figure 3

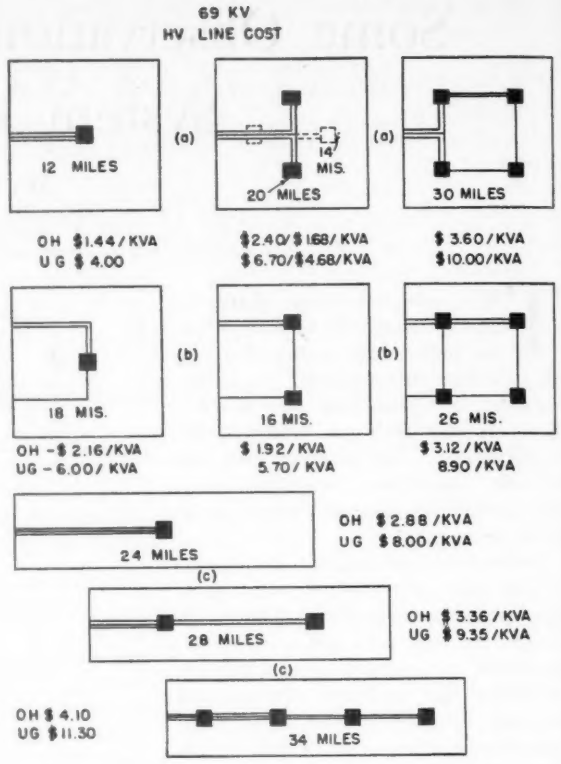

Figure 4

sizes of substations considered. The feeder reactors could have been omitted from the 40,000-kva size, from the viewpoint of short-circuit duty. They are left in merely from the point-of-view of maintaining voltage during faults. The 20,000-kva size was considered small enough to dispense with them from that point-of-view.

In Fig. 2 is shown the cost per kva of the substations. Our principal interest is not the actual cost, but the relative cost of the three sizes, per kva. It will be noted that the small substation consistently has the lowest cost. The reason for this is the metal-enclosed switchgear of 500,000 kva interrupting capacity. The other substations have the more expensive, higher - interrupting - duty switchgear.

Observe that the use of a double bus does not materially change the relation between sizes. It simply raises the level of them all. The difference between a 20,000-kva and 40,000-kva is substantial for all arrangements. The 138-kv supply gives the greatest spread in cost. This is accounted for by the extra transformer associated with two source supplies, plus the voltage charge for the greater insulation. The spread is somewhat greater for indoor equipment than for outdoor equipment.

Comparing a 20,000-kva substation with an 80,000-kva substation, the spread (or extra cost) for the larger substation is from zero to $3.50/kva. Between a 40,000-kva and 20,000-kva substation, the spread is $2.33/kva to $4.25/kva more for the larger one.

Obviously, the 20,000-kva size is not the largest that can be built and still keep within the 500,000-kva rating. Increasing the transformer size to the value that will give a short-circuit kva of 500,000 will give a still lower cost per kva. A 40,000-kva or an 80,000-kva could be built up of 20,000-kva units and, thereby, equal or better the 20,000-kva costs when real-estate and operators' costs are included.

The development of modern, factory-assembled, metal-enclosed switchgear (500,000-kva duty) for 13.8-kv circuits has lowered substation costs substantially. Large substations can be constructed by multiples of small substation units. Therefore, the cost per kva of large and small substations can become nearly equal.

Consequently, the two remaining items, HV lines versus LV lines, give the key to the economic size to adopt. It is equally obvious that LV lines become shorter with smaller substations, and HV lines become longer. Therefore, if any saving is to be made with small substations, it must be made in the LV lines. Any factor increasing the unit cost of HV lines, such as expensive rights-of-way or underground construction, favors the larger substation. Similarly, any factor that increases the unit cost of LV lines, such as underground construction, favors the smaller substation.

In Fig. 3 are illustrated the length, voltage drop (90 per cent p-f), mileage, and costs of the LV lines. The 3a group illustrates simple radial feeders to each load area. The 3b group shows the simple radial feeders to two load areas in solid lines. The dotted line between the two feeders represents a third feeder that ties the two radial feeders together through their branches. This forms a re-enforced loop to give continuous service in the event of a feeder outage. The figures below this group give only the extra cost for this re-enforcing feeder. It is to be added to the cost in 3a. The 3c group shows the cost for simple radial feeders in a long, narrow, load area.

The lower cost and lower voltage drop of the feeders supplied from the smaller substation are clearly seen. The saving is greater for underground construction, greater for re-enforced loop, and greater for long narrow areas.

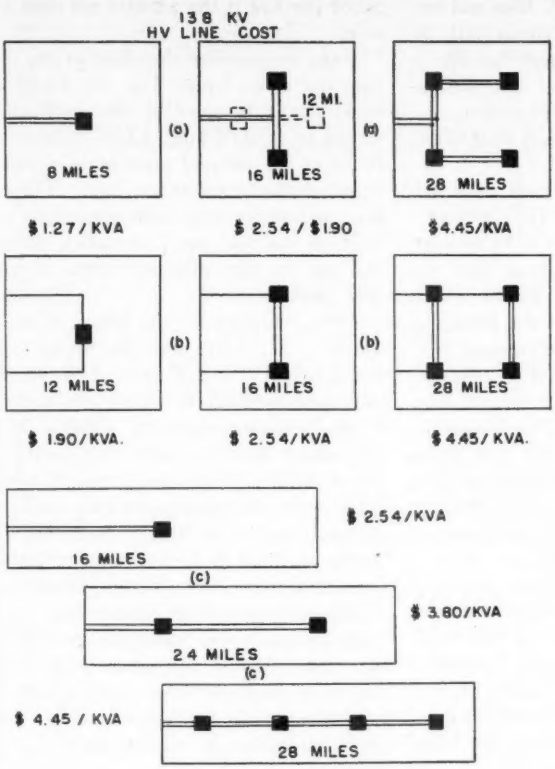

Figure 5

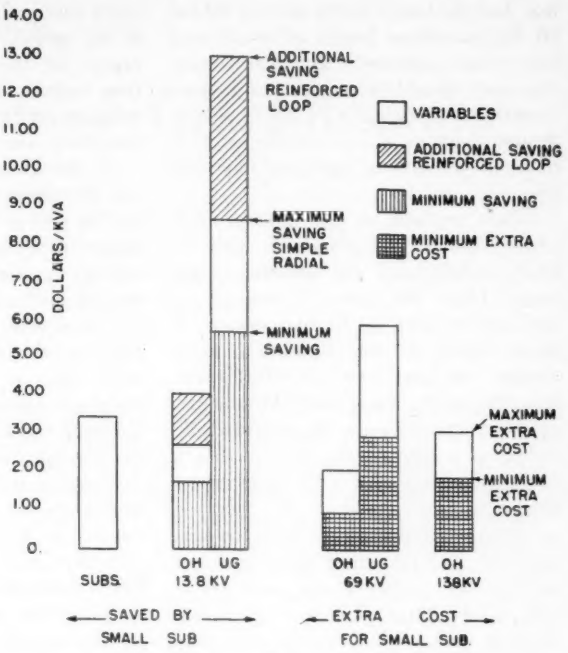

Figure 6

Smaller substations fit better into odd-shaped areas than do the very large substations.

In Fig. 4 are illustrated the 69-kv, HV lines supplying the substations. Three lines are used. They carry 40,000 kva, each under the condition of one feeder out. 4b is a variation in the direction of entrance to the load area. Other variations are obvious.

An examination of these figures shows clearly the greater cost for HV lines when supplying small substations. 3a gives a greater extra cost for HV lines than do the others. 3b gives the lowest extra cost for the HV lines.

Fig. 5 is for 138 kv, and is otherwise the same as Fig. 4. One line will carry the 80,000-kva with the other line out of service. An examination of this chart will show that the 138-kv costs are substantially higher and, therefore, favor the larger substation. 138-kv, underground cable was not considered in the study.

Having examined the three subdivisions separately, we are now ready to place them side by side. This is done in Fig. 6. On the left, we have the savings made by a 20,000-kva substation compared with the 80,000-kva substation.

On the savings side, we have shown savings in the substations themselves, based on the cost indicated in Fig. 1. Here it is seen that the saving may be as much as $3.50/kva or it may be zero. If the comparison were based on using the same size and type of switchgear for the small, as for the large substation, the column would be somewhat shorter, or over on the other side, as an extra cost instead of a saving. This extra cost could be nearly as much as the indicated extra saving.

The next two columns indicate the savings to be made in the 13-kv circuits —one column for overhead and the other for underground. Each column indicates, in the horizontal shading, the minimum saving. At least that much can be saved in 13.8-kv circuits. Then, the maximum saving that can be obtained, if the feeders are simple radial, is indicated at the top of the white portion. This white portion of the column also indicates the spread in savings made by simple radial feeders. The slanting shaded portion of the column indicates the maximum amount that could be saved if the reenforced loop were used.

Now, if we had all 13.8-kv circuits overhead, and a 20,000-kva substation built of the same kind and size of switchgear as the 80,000-kva substation, then we could not hope to justify a 20,000-kva substation. The extra cost of the small substation, in that case, would nearly equal the maximum saving we could possibly make in 13.8 kv. We certainly would not have enough left over to make up for extra cost in high-voltage lines, let alone real estate.

If all of the 13.8-kv circuits are underground, it is at once obvious that we have much to save. Even the minimum saving we are sure to have is much greater than would be the extra cost for the small substation, if it were composed of the more expensive switching equipment.

On the extra-cost side of Fig. 6, we have the HV lines. The white portion of the column indicates the spread between the minimum extra cost and the maximum extra cost incurred by the HV lines supplying the smaller substations. It is seen that the maximum extra cost for 69-kv overhead lines is not much greater than the minimum saving made in the 13.8-kv overhead lines. Therefore, the combination of 69-kv overhead, 13-kv overhead, and 20,000-kva substations with 500,000-kva duty, metal-enclosed switchgear, can be reasonably expected, in some cases, to be more economical than 80,000-kva substations.

If the 69-kv is underground and the 13.8-kv is overhead, then a look at the two columns will show that the maxi-

mum possible saving for 13-kv radial is less than the lowest extra cost for 69-kv. So, the maximum benefit of re-enforced loop, plus a substantial saving in substation costs, would be required to produce a comfortable margin. So, 69-kv underground cable is a very serious obstacle to small substations supplying overhead lines.

When we look at the underground, 13.8-kv column and compare it with the 69-kv underground, the situation is different. Here, the minimum amount we are sure to save in 13.8-kv circuits is about equal to the maximum extra amount we must spend in 69-kv cable. It is easy to see that if both HV and LV lines are underground the smaller substation is a safe conclusion. It has a very good chance even if the more expensive switchgear is used.

When we compare the 138-kv column with the 13.8-kv, overhead column, we see that the conditions are more favorable to the large susbtation than was the case with 69 kv, thereby producing uncertainty as to the place of the smaller substation. Observe that the minimum saving and the minimum extra cost are about equal. The same is true for the maximum extra cost for 138 kv and the maximum saving for 13.8 kv with simple radial feeders. So, with 138-kv overhead supply and 13.8-kv overhead lines, the small substation must depend on both the saving of re-enforced loop and lower substation costs.

Now, let's see what happens when the load density is different from the 1250 kva/square mile we assumed. The most simple way is to assume that the shape of the area stays the same for any load density. Therefore, we can change the density simply by changing the scale or the length and breadth of the area. Instead of 8 x 8 = 64 square miles, we can have 16 x 16 = 256 square miles, or 4 x 4 = 16 square miles. If we double the scale the area is 4 times. If we cut the scale in half, the area is one-quarter. Therefore, with the load remaining the same, the density varies inversely as the area. Consequently, the scale varies inversely as the square root of the area. So, if we assume 4 times the density, we have an area 16 square miles instead of 64 square miles. Each side is now 4 x 4 instead of 8 x 8.

Now, if the scale is one-half, with four times the density, then the length of each HV and LV line is reduced to the same extent. Our cost per mile being the same, our total cost for HV lines and LV lines is, therefore, cut in half. Likewise, our saving in LV lines and our extra cost in HV lines is cut in half. So is our spread. So is our scale in Fig. 6 except for the substation. The substation remains as before. Therefore, the columns for the HV and LV lines maintain their same relation.

It should be obvious, then, that we can determine the cost of HV lines versus the cost of LV lines at 1250 kva per square mile, and then adjust that result up or down inversely as the square root of the load density. If the saving in LV lines exceeds the extra costs of HV lines by X dollars at 1250 kva/square mile, then at 4 times the density the saving is reduced to X/2 or one-half. Likewise, if instead, the HV line extra cost exceeded the LV line saving at 1250 kva/square mile by X dollars, then at four times the density, the extra cost is reduced to X/2 or one-half.

Now, since the substation cost per kva is constant for any density, it should be clear that its influence on the total picture increases as the density increases. If the substation costs are lower for the small substation, then at very high densities the saving in LV versus HV lines may be so small that the only saving occurs in the small substations. If the substation cost is higher for the small substation, then a higher density is soon reached where the small substation gives a higher total cost even though we are not including real estate.

The cost comparison between two particular conditions can be done simply by adding the three different costs. Suppose we assume square load-area, the transmission arrangement shown in 5a, 138-kv transmission supply, and 13.8-kv overhead lines.

	20,000 kva	80,000 kva
HV Line Cost (5a)	$4.45	$1.27
LV Line Cost (3a)	1.85	3.70
	$6.30	$4.97
	4.97	
	$1.33 Extra cost for small substation	

Here we see that at 1250 kva/square mile, we could not justify the small substation supplied from 138 kv, if the small substation cost equals or is greater than the large substation cost/kva. The small substation would have to be $1.33 less per kva to break even. If, however, we take into account real estate as we should, then the small substation would have to save even more. Suppose each lot costs $20,000, then we would have $80,000—$20,000 = $60,000 extra real estate cost for the small substation. This is $0.75 per kva. So $1.33 + $0.75 = $2.08 per kva is the amount we need to save.

Next, we consider the effect of the re-enforced loop. From Fig. 3c, $1.85—$0.47 = $1.38 saved by the small substation in the LV lines. $2.08—$1.38 = $0.70 as the reduced amount that must be saved in the substation cost. Therefore, as long as large substations can be built of multiple small-substation units, the case for the small substation is not very good.

Next, we consider the effect of load density. $1.33/kva was the amount by which the HV + LV lines of the small substation exceeded the large substations. If we have one-fourth the density, 312 kva/square mile, this extra cost is $1.33 x 2 = $2.66. This would make it more difficult for the smaller substation. The voltage drop in the longest feeder is, of course, doubled to 17 per cent with the big substation. So, voltage limitation would then come in to favor a small substation whose drop would be only 5.64 per cent. If, on the other hand, the density is increased four times to 5000 kva/square mile, the extra cost for the small substation is reduced $1.33/2 = $0.67.

If, now, we bring in the re-enforced loop again and vary the density, we get a somewhat different picture. The small substation HV + LV line costs $1.33 more than the big substation. The saving in re-enforced loop for the small substation is $1.38. So $1.38—$1.33 = $0.05/kva saving for the small substation. If this is cut in half or doubled, it still is insignificant. Therefore, with this combination, it does not matter what the load density is. Voltage drop and substation costs would be of more influence. Still, we do not have a good case for the small substation with 138-kv supply.

Let's try the long narrow area which Fig. 3c shows to favor the small substation.

	20,000 kva	80,000 kva
HV Line Cost (5c)	$4.45	$2.54
LV Line Cost (3c)	1.85	4.63
	$6.30	$7.17
		6.30
	Saved by small substation	$0.87

Here, we see that the small substation has a saving instead of an extra cost. If we add the $1.38 saving for re-enforced loop, we save $1.38 + $0.87 = $2.25/kva. At one-quarter the density, this becomes $4.50; at four times the density, it becomes $1.13. The latter figure is too small a margin and, therefore, de-

(*Continued on page 213*)

Progress Report No. 3

Fundamental Investigation of Graphitization of Piping

CONDUCTED BY JOINT EEI-AEIC SUBCOMMITTEE ON GRAPHITIZATION OF PIPING
L. E. HANKISON, T. E. PURCELL, ALEX D. BAILEY, *Chairman*,
SABIN CROCKER, *Secretary*.

June, 1945

THREE previous progress reports on the "Fundamental Investigation of Graphitization" have been distributed in mimeograph form to those interested and published in the October 1943, April 1944, and October 1944, issues of the EDISON ELECTRIC INSTITUTE BULLETIN. The first report covered the preliminary field survey and outlined the program to be carried out at Battelle Memorial Institute. The second report listed the ten questions which formed the basis of that program, described the work in progress at Battelle, classified the degree of graphitization reported for some thirty-eight different piping systems, and called attention to the desirability of limiting the extent and duration of temperature swings above design temperatures. The third report presented a digest of statements on independent laboratory investigations, described the Battelle findings up to that time, and attempted to relate both to the original ten questions. Suggestions and tentative recommendations were made regarding: (1) stress-relieving temperature; (2) restoration of partially graphitized joints; (3) pipe material for 850 F to 950 F service; (4) casting material for 850 F to 950 F service; and (5) heat treatment of pipe and pipe bends prior to installation.

In this, the fourth reoprt, the work done at Battelle since issuance of the third report is described, the findings are summarized, and recommendations previously given are discussed in the light of subsequent developments.

Work at Battelle Memorial Institute

Some 123 of a total of 213 samples of welded and unwelded carbon-molybdenum and carbon steel piping materials remain on test. Samples in general are bars ½ to 1 in. thick, 1 in. wide, and 6 to 8 in. long. A ⅜ in. micro-specimen has been cut from each bar at approximately 500, 1500, 3000 and 5000-hour intervals of heating at 925 F and 1025 F, and at 1125 F followed by cyclic heating at temperatures of 950 F—1050 F—1150 F—1050 F, etc., with weekly changes of temperature for the last 1150-hr of the 5000-hr period.

Unwelded Samples of Carbon-moly Pipe

Microscopic examination of unwelded samples at the end of 3000-hr heating at 925 F, 1025 F and 1125 F revealed a trace of graphite in both the high- and low-aluminum varieties of carbon-moly pipe. The high-aluminum pipe was used pipe from the Springdale plant which was reported to have been deoxidized with 1½ to 2 lb of aluminum per ton. The low-aluminum pipe was new pipe deoxidized with ½ lb of aluminum per ton. At the end of 5000-hr at 925 F, the graphite was classed as of the random type, little in amount, and fine in size for both varieties of pipe. Only a little more graphite was produced by heating for 5000-hr at 1025 F than at 925 F, or by heating for 3850-hr at 1125 F followed by 1150-hr at temperatures varying from 950 to 1150 F. The finding of graphite after 3000-hr in samples heated at 925 F, particularly in the cast of low-aluminum pipe, is significant. No graphite had been found in the same specimens at the end of the 1500-hr heating period, as was reported in Progress Report No. 3. Apparently the incubation period for the low-aluminum carbon-moly pipe is longer than for the high-aluminum type, but at the 5000-hr point about the same amount of random graphite had formed. No marked differences in amount of graphite were found for specimens given different heat treatments prior to testing. This finding enabled tests on 70 per cent of these specimens to be discontinued at the end of 5000-hr.

Bead-Welded Carbon-Moly Specimens

Examination of bead-welded high- and low-aluminum carbon-moly specimens after testing periods of 3000-hr and 5000-hr at 925 F and 1025 F, and after 3850-hr at 1125 F followed by 1150-hr at 950 to 1150 F showed no evidence of segregated graphite at the edge of the weld heat-affected zone. However, appreciably larger nodules of random graphite were found in the bead-welded high-aluminum specimens than in the unwelded specimens of the same material. Appreciable increases in amount of graphite were noted between the 3000- and 5000-hr tests of the high-aluminum pipe. Both samples were from used Springdale pipe. Practically no difference was found between the welded and unwelded samples of new low-aluminum pipe. Only a slight increase in amount of graphite was found between the 3000- and 5000-hr tests of the low-aluminum pipe.

A second series of bead-welded specimens representing high-aluminum and low-aluminum carbon-moly pipe and a carbon-moly header rated as "normal" in the McQuaid-Ehn test has been examined after 2000-hr at temperatures of 925, 1025 and 1125 F. Small amounts of fine random graphite were reported for the high-aluminum sample, traces in the low-aluminum pipe, and none in the "normal" header material.

Bead-Welded Carbon-Steel Specimens

Bead-welded specimens of high-aluminum (1.3 lb Al per ton) and low-aluminum (0.4 lb Al per ton) plain carbon steels have been examined after 500, 1500, and 3000-hr testing periods. Testing temperatures were the same as for the carbon-moly steels; i.e. 925 F, 1025 F, and 1125 F. Graphitization of carbon steels at 925 F was found to be considerably more rapid than graphitization of carbon-moly steels at 1025 F. Even 500-hr was sufficient to develop graphite in all the high-aluminum samples and in some of the low-aluminum samples as well. Little difference was noted between the three testing temperatures. At the end of 1500-hr, appreciable amounts of graphite were present in all specimens.

However, larger particles and greater numbers were observed in the high-aluminum steels.

The most important feature observed in the bead-welded carbon-steel specimens was the tendency of the graphite to segregate at the low-temperature edge of the weld heat-affected zone in all except those specimens that had been stress relieved at 1370 F. This temperature is about 55 F above the lower critical point of the material tested. This is the first evidence of preferential graphitization being produced by the bead welds. This segregation was more fully developed by the 3000-hr heating period at 925 F and at 1025 F, and by 1850-hr at 1125 F followed by 1150-hr at 950 to 1150 F. The base material in all the samples appeared to be nearly devoid of carbide containing areas, i.e., it was decarburized as the result of graphite formation. One third of the specimens have been removed from test, but the 48 specimens remaining should demonstrate whether further migration of graphite to the heat-affected zone will occur, and whether the Springdale type of segregated graphite will result in these carbon steels.

Butt-Welded Carbon-Moly and Chrome-Moly Specimens

Butt-welded joints between plates of straight silicon-killed carbon-moly and between plates from experimental heats* of high aluminum (2.5 lb Al per ton) and straight silicon-killed carbon-moly with varying additions of chromium have been examined after 1000-hr at 1025 F. Specimens as-welded, stress relieved at 1200 F and 1300 F, and normalized at 1650 F were tested. No positively identifiable graphite was found in any of these specimens, although a trace of graphite was reported for a straight silicon-killed carbon-moly as-welded specimen with 0.50 per cent chromium addition after 1000-hr at the cycling temperature of 950 to 1150 F. These findings will be checked after 1500-hr further heating.

A butt-welded joint between unused short lengths of high-aluminum and low-aluminum carbon-moly pipe made by The Detroit Edison Company was sectioned and across-the-weld samples were heat treated at 1200 F, 1300 F, and 1650 F. Examination at the end of 1000-hr at 1025 F showed traces of graphite in the high-aluminum pipe in the as-welded and 1200 F and 1300 F stress-relieved conditions. None was found in the specimen normalized at 1650 F. No graphite was produced in the low-aluminum pipe by 1000-hr at 1025 F in the as-welded or in any of the heat-treated conditions. As-welded samples also were heated at 925 F and at the cycling temperatures of 950 to 1150 F. Traces of graphite were reported for the high-aluminum pipe, but none for the low-aluminum pipe. The identification of graphite in the high-aluminum sample at 925 F was somewhat indeterminate. A further heating period of 1500-hr should give more positive results.

A butt-welded joint between high-aluminum and straight silicon-killed chrome-moly pipe has been made up by the Consolidated Gas, Electric Light and Power Company of Baltimore for use in the Battelle investigation. These materials are of especial interest since they contain about ½ per cent chromium as a preventive of graphitization. Tests should demonstrate the effectiveness of this amount of chromium and whether there is a need for limiting the amount of aluminum used in deoxidation.

Reports From Operating Companies

Examination and periodic re-examination for graphite in welded joints of carbon-moly and carbon-steel piping is being conducted by many operating companies. In one case having 23,000 hr at an average temperature of 942 F, with occasional swings to 1000 F for short periods, no graphite was found. The pipe material was made to the coarse-grain requirement of A206-39T, but was reported to have been deoxidized with 1 and 1.3 lb of aluminum per ton, respectively, in the different heats supplied. No graphite was found in another plant, having 23,000-hr at an average temperature of 907 F, with swings to 935 F. This pipe material was made to ASTM A206-38T which did not include grain size requirements. However, since it was deoxidized with only 0.4 lb of aluminum per ton, it conformed to the low-aluminum type of carbon-moly pipe.

A different graphitization phenomenon has recently been found in the Springdale pipe about two feet from the original failure. Graphite appears to have precipitated out along slip planes in the old pipe for a distance of about ten inches from the replacement weld. The orientation of the slip planes is such as could have been produced by a combination of hoop tension and axial compression or by torsion.

Reports on Other Research Investigations

Several formal reports and a number of verbal reports have been received on other graphitization investigations. The Philadelphia Electric Company, Consolidated Gas, Electric Light and Power Company of Baltimore, General Electric Company, National Tube Company, Public Service Electric and Gas Company (New Jersey), Lunkenheimer Company, Babcock and Wilcox Company, and The Detroit Edison Company are among those actively engaged in such research.

Some of these investigations are so comprehensive and the heating periods planned are so long that only preliminary results are available at this time. Knowledge of the lines of attack to be followed and the free interchange of information on these investigations, however, have been of inestimable value to the Battelle investigation. It is hoped that complete reports of the several investigations will be presented at the earliest opportunity.

Summary of Findings

The specific cause of graphitization has not yet been determined. It appears that several interrelated factors are involved, some of which are still unrecognized. No marked difference in the rates of graphitization has been found for specimens normalized at 1650 F after heating to 2200 F and those air cooled from that temperature. Thus the fact that pipe ends at Springdale were upset without subsequent heat treatment is not considered a basic factor, although it may have affected the type of graphite formed.

Deoxidation practice appears to have a definite effect upon the time required to initiate graphite and the rate of its increase. Steels with high aluminum additions (1½ to 2 lb per ton) generally are more susceptible to graphitization than are steels with low-aluminum additions (0.5 lb per ton). Straight silicon-killed steels are resistant to graphitization and in some cases appear to be immune. McQuaid-Ehn tests give useful indications regarding deoxidation practice. For a given deoxidation practice, molybdenum steels are more resistant than carbon steels. The addition of varying amounts of chromium to carbon-moly steels is under investigation and would seem to offer good promise.

Varying degrees of graphitization have

* McQuaid-Ehn tests showed the high-aluminum material to have an ASTM grain size of 7 to 8 and to be "abnormal," although the material having a chromium addition of 0.70 per cent was only slightly abnormal. The straight silicon killed materials had a grain size of 1 to 3 and were classed as "normal."

been found in samples from steam lines and in the experimental specimens. Only the segregation of graphite at the low-temperature edge of the weld heat-affected zone and along strain lines as found at Springdale, and the heavily concentrated nodular type found in a few other locations, can be considered as serious enough to warrant replacement of welded joints or entire piping systems.

Discussion of Previous Recommendations

Recommendations and suggestions were given on five specific questions in Progress Report No. 3. On the basis of subsequent findings the following modifications seem desirable:

(a) Best Stress Relieving Temperature for Welds

Present indications are that heating both carbon steel and carbon-moly welded joints at a temperature around 1400 F is more effective than 1300 F in preventing graphite segregation adjacent to welds. It will not, of course, prevent random graphite formation in the body of the pipe, if the material is susceptible to graphitization. Comprehensive tests to determine the best stress-relieving temperature and procedure are underway.

(b) Restoration of Partially Graphitized Joints

The restoration of partially graphitized joints by normalizing or by a somewhat lower temperature heating as a preventive of graphite segregation adjacent to welds seems to offer promise, but trials on actual pipe line welds have not been made. Where graphite of the chain or segregated type exists, restoration by heating has not proven successful in that the shock resistance is still impaired.

(c) Specification of Castings for 850-F to 950-F Service

As pointed out in Progress Report No. 3, the addition of an alloy to castings does not increase their cost proportionate to the increase in cost of pipe for an equivalent alloy addition. In order to retain the advantages of aluminum deoxidation, it seems desirable to specify chrome-moly or chrome-nickel-moly castings for temperatures of 850 F to 950 F. A low-aluminum carbon-moly casting material was suggested for 925-F service in Report No. 3, but its actual development would not appear to be justifiable.

(d) Specifications of Pipe Material for 850-F to 950-F Service

A new specification has been developed under ASTM procedure for ½ per cent chromium—½ per cent molybdenum pipe that is expected to be highly resistant, or possibly immune, to any graphitizing tendency at temperatures up to 950 F. The deoxidation practice is governed by the requirement that the ingots and billets from which the pipe is made shall show a grain size of 1 to 5 on McQuaid-Ehn test. The allowable working stresses for this material are considered to be equivalent to those now given for carbon-moly pipe. One order for ½ per cent chrome ½ per cent moly pipe of this sort has been placed by Philadelphia Electric, while another order involving two heats, one made with 1¼ lb of aluminum per ton of steel and the other without the specific addition of aluminum, has been placed by the Consolidated Gas, Electric Light and Power Company of Baltimore. The two heats ordered by Baltimore will afford opportunity for comparing the merits of both types through laboratory tests and in an actual installation.

In order to maintain reasonable pipe dimensions for higher pressure plants at temperatures of 950 F and higher, consideration is being given to chrome-moly analyses having higher chromium contents than ½ per cent. Ranges of chromium of 0.80 to 1.10 per cent and from 1 to 1½ per cent have been advocated for such service. Among the chrome-moly steels having compositions in these ranges are those covered by the following ASTM specifications: A158, Grade P11; A200, Grade 1; and A213, Grades T11 and T12. Pipe conforming to A213, Grade T12 has been bought for a recent extension at Springdale.

The present specification for carbon-moly pipe of the low-aluminum type, ASTM A206-44T is still available for those who have occasion to use this material. A206-44T is being continued unchanged except for deleting from the title and scope clause the statement that this material is "intended for service at metal temperatures from 750 to 1000 F." The foregoing temperature range will be supplanted by the expression "suitable for high-temperature service," thus leaving the way open for codes and designing engineers to set their own temperature ceilings for the product.

The following temperature limits are suggested by the Joint EEI-AEIC Subcommittee as reasonable operating limits for the various pipe materials:

Carbon steel, low and medium carbon	825 F
High-aluminum carbon-moly (1.5 to 2 lb. Al per ton)	900 F
Low-aluminum carbon-moly (0.5 lb. Al per ton)	925 F
Chrome-molybdenum (½% Cr—½% Mo)	950 F*

Operating temperature swings should not exceed the above temperatures by more than 25 F.

The suggested temperature limits are based on consideration of service experience exceeding 60,000-hr in the case of carbon steel and high-aluminum carbon-moly pipe as well as laboratory findings to date. The service experience with low-aluminum carbon-moly so far reported is only of the order of 20,000-hrs, but laboratory findings confirm its greater resistance to graphitization.

(e) Heat Treatment of Carbon-Molybdenum and Chrome-Molybdenum Pipe and Bends Prior to Installation

Heat treatment at the pipe mill, except by special agreement, consists of a stress-relief anneal by heating at 1200 F followed by slow cooling. Where pipe is installed without subsequent heating for fabrication of bends, consideration should be given to a normalizing treatment. Normalizing low-aluminum carbon-moly pipe and pipe bends by heating to 1750 F and cooling in air has been found to produce a desirable structure from the standpoint of creep resistance. A similar treatment should be suitable for chrome-moly pipe and bends, but the exact treatment to give high creep strength and other desirable characteristics has not been agreed upon.

* Higher temperatures may be found permissible for chrome-molybdenum pipe as far as graphitization is concerned.

Pugent Sound Company

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Five other electric companies received Honorable Mention in the contest:

Mississippi Power & Light Company, Jackson, Miss.

Kansas Gas & Electric Company, Wichita, Kan.

Carolina Power & Light Company, Raleigh, N. C.

Dallas Power & Light Company, Dallas, Texas.

Southern Canada Power Company, Ltd., Montreal, Can.

The contest has been sponsored for a number of years by the Reddy Kilowatt Service, an advertising and public relations agency in the electric industry. The judges were:

Merryle Stanley Rukeyser, Economic Analyst and Financial Writer; S. B. Williams, Editor, *Electrical World*, and Col. H. S. Bennion, Vice-President and Managing Director, Edison Electric Institute.

Wisconsin Association Troupers Carry Farm Electrification Story to 4 H Leaders Throughout State

By A. F. Herwig

Executive Secretary, Wisconsin Utilities Association

A NEW story in pioneering elementary appreciation on how to use electric service efficiently and safely on farms has just been enacted for 4 H club leaders by the Wisconsin Utilities Association, with Miss Evelyn Evert, A. J. Von Burg and B. J. Auchter as instructors.

The three valiant and versatile troupers, actors, demonstrators, instructors or what other name that might be used to characterize them have returned to their companies after traveling nearly 1700 miles by automobile to six 4 H Club Leader Training camps covering nearly every county in Wisconsin from May 31 to June 24.

They taught and demonstrated to 4 H Club Leaders in the state the necessity of adequate wiring and fusing, the requirements of good lighting, selection of proper cords and how to repair them, and how to build home-made chick and pig brooders when necessary.

Farm boys, girls and adults, plus county agricultural agents, numbering in all approximately 600, participated in four classes of one hour each and listened to the story of electricity in the home and on the farm at the six camps. The information these leaders garnered will be passed on by them to the membership of their individual 4 H clubs.

The foregoing, in a prosaic way, tells the cold nutshell facts of the enterprise. It does not tell the tribulations experienced by our troupers in driving through rain and over rain-bogged roads, dragging heavy demonstration equipment up flights of stairs in school houses, revising and perfecting individual presentations to create a unified production or the worries connected with setting up and connecting up demonstration paraphernalia. Nor does it tell of the joy experienced in seeing the 4 H Club leaders eager for information, asking questions and seeking the written instructional material that was made available.

The earnestness and studiousness of the 4 H Club leaders were a continuous inspiration to the Association's three troupers. The presentations were the talk of each camp. They were so interesting that other class instructors and county agents attended them. Miss Louisan Mamer, REA advisor for boys and girls club work, St. Louis, was an intensely interested observer at the first camp in Campion high school, Prairie du Chien, May 31-June 3.

The first hour in the electric course was conducted by Miss Evert and Mr. Auchter. Miss Evert of the Wisconsin Electric Power Co. taught the need for adequate wiring and fusing. With the use of demonstration equipment she showed what happened when a home was adequately or inadequately wired, how appliances would work or would not work, how electric service was used efficiently or wastefully. How fuses should be selected and replaced. Mr. Auchter of the Wisconsin Gas & Electric Co., with the aid of charts, pointed out the various kinds of wires that should be used. Both presented their story in A. B. C. form. Suggested projects that might be carried out by the 4 H Clubs were described and then offered in memoranda form.

Mr. Von Burg of the Wisconsin Power & Light Co. conducted the second hour. He used demonstration equipment to contrast good with poor lighting, emphasizing the need for the purchase of correct voltage lamp bulbs, selection of the proper amount and quality of light, effect of bare lamps, of shades and reflectors. He visualized the cheapness of good lighting, gave sight tests and wound up his glamorous story with a demonstration of fluorescent lighting. He also offered written memoranda on lighting projects that might be carried out by club members.

The third and part of the fourth hour were devoted to instruction in the selection and repair of cords and in building of chick and pig brooders. Miss Evert explained and demonstrated cord care and induced class members to repair pieces of cords which were placed at their disposal. Mr. Auchter showed models of brooders, described their great worth in producing healthy chicks and pigs, told how much more money farmers could make by using brooders and described how they could be made cheaply if farmers were unable to purchase them. Mrs. Margaret McCordic, University of Wisconsin Extension Department, took charge of the first camp classes on cords and then Miss Evert taught at the five other camps.

Rural representatives of the companies operating in the different territories where the camps were conducted, cooperated with the three musketeers in the manual and class work required and in answering questions.

Everyone who attended the camps was tremendously impressed with the great practical and inspirational work that the 4 H Clubs are performing. The leaders at the camps will be the practical farmers of tomorrow and what efficient farmers they will be!

The first camp at Prairie du Chien attracted leaders from the following counties: Trempealeau, Jackson, La Crosse, Monroe, Juneau, Vernon, Crawford, Richland, Grant, Iowa, La Fayette and Green.

The next camp was at a Lutheran Bible camp in Chetek June 3-6. Leaders from the following counties attended: Burnett, Washburn, Polk, Barron, Rusk, St. Croix, Dunn, Chippewa, Pierce, Eau Claire and Buffalo.

The third camp was held at Lawsonia in Green Lake, June 7-10. Leaders came from the following counties: Portage, Waupaca, Outagamie, Brown, Kewaunee, Door, Manitowoc, Sheboygan, Fond du Lac, Calumet, Winnebago, Waushara, Marquette, Green Lake, Columbia, Sauk, Dodge and Dane.

The fourth camp was at Wausau, June 10-13, which drew leaders from Florence, Forest, Marinette, Oconto, Shawano, Waupaca, Portage, Clark, Marathon, Taylor, Lincoln and Oneida counties.

The fifth camp was at Pigeon Lake, June 14-17. Counties represented were Douglas, Bayfield, Ashland, Iron, Vilas, Price, Sawyer and Washburn.

The sixth camp was held in Williams Bay, Lake Geneva, June 21-24. Leaders attended from Walworth, Kenosha, Racine, Milwaukee, Waukesha, Washington, Ozaukee, Dodge, Dane, Jefferson and Rock counties.

Subtransmission System Economics

(*Continued from page* 208)

mands a saving in substation cost as well. So we see that we have some margin at 1250 kva per square mile and below, but a questionable margin at higher density.

Therefore, we are brought to the realization that 138 kv leaves a limited application for smaller substations, unless the 13.8-kv lines are underground. The analysis could be carried further, but Fig. 6 shows the underground advantage so clearly that it seems unnecessary. However, the higher the density, the more necessary underground construction becomes. Therefore, the small substation supplied from 138 kv might be justified in long narrow areas at light density, with overhead construction, and still justified at the higher density by the need for underground lines.

The study also included the use of HV switchgear at the substations. Since it increases the HV cost, it works against the small substation. However, at 138 kv, the HV line cost for the small substation can be reduced by using a simple loop with one circuit breaker between the two banks of transformers. This paper is already too long, so just one more observation will be made.

The study assumed that the areas for the small substations were contiguous. As a matter of fact, there are not many contiguous areas with as much as 80,000 kva. Most load areas of such large size are broken up into smaller load areas. So, practically, it will be found that the longer LV lines from a big substation to reach these substation areas will make it much easier to justify the smaller substation.

It is obvious that no definite conclusions that would be applicable to any particular system could be drawn from such observations. It is equally obvious that it would be to the interest of each company to make an analysis along similar simplified lines, using their own costs.

Wiring Committee Activities

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to have the Wiring Committee prepare the necessary drawings. The Technical Section hopes to complete this work within the next month.

3) Work with the Training Committees in preparing Sales Training Programs. The chairman of the Wiring Committee was requested to write all of the Sales Training Sub-Committee Chairmen offering the services of the Wiring Committee.

4) Carry on the standardization program on breakers jointly with the A.E.I.C. Committee. Tentative agreements have been reached between the joint committees and the manufacturers regarding the following items:

a) The present tentative proposals would standardize enclosures for 8 and 4 pole units. This would be made possible through the interchange of various breakers both as to single pole and double pole combinations, and it is hoped in most instances between various makes.

b) The greatest change to be gained by the proposed standardization is in the fact that manufacturers would not need to list and the jobbers would not need to stock the multiplicity of types and sizes now available.

c) In addition, the customer would benefit because he will have an installation which may be changed or to which additions may be made.

5) As you know, the Wiring Committee has one representative on the Industry Committee on Interior Wiring Design, and the preliminary draft of this manual was presented to the Wiring Committee at its meeting. After it was reviewed it was accepted by the Committee after a few minor changes were suggested. The Committee feels that this manual will be very useful.

Twelve projects were presented at the Committee meeting to be considered for the new Promotional Section to work on. Each one was discussed in detail and it was finally decided that this Section would begin work on the following projects:

a) Review existing E.E.I. promotional material on wiring, in view of preparing articles for publication.

b) Review existing E.E.I. slides on wiring with the thought in mind of preparing a wiring educational program through the use of slides and script that could be written. Parts of this program to be used in any one of the sales programs prepared by residential, commercial, or rural committees.

c) Plan to prepare one page of copy on wiring bi-monthly for the E.E.I. BULLETIN.

d) Initiate a plan to collect and disseminate publicity material pertaining to wiring promotion and technique.

Wm. C. Richardson

WILLIAM C. RICHARDSON, executive vice-president and treasurer of the Indianapolis Power and Light Company, died June 17 of a cerebral hemorrhage in Indianapolis after a brief illness.

Mr. Richardson was a pioneer in electric service development in Indianapolis. Before being elected executive vice-president and treasurer, April 25, 1945, he was for many years vice-president, treasurer and assistant secretary. He also was an officer and director of the Mooresville Public Service Company and the Electric Building Company, Inc.

Mr. Richardson was born June 19, 1889, in Topeka, Kansas, son of William C. and Ida A. (Hale) Richardson. After completing his high school course, he came to Indianapolis and worked as an errand boy for The Indianapolis News. In 1908 he became a clerk with the Union Traction Co. and was associated with the public utility business until his death.

From 1909 until 1912 Mr. Richardson was clerk of the Terre Haute, Indianapolis & Eastern Traction Company. He went with the old Indianapolis Light and Heat Company and remained with that company and its successor, the Indianapolis Power and Light Company. He became treasurer of the Light and Heat Company Feb. 16, 1924, and was elected treasurer and a director of the Indianapolis Power and Light Company when it was incorporated, Oct. 27, 1926. He became vice-president, treasurer, assistant secretary and a director of the company Feb. 22, 1936.

M. S. Sloan

MATTHEW S. SLOAN, who until his resignation as president of the New York Edison Company and affiliated companies in 1932, had been an outstanding figure in the utility field in New York City, died on June 14 in New York Hospital at the age of 63 years. Mr. Sloan was president of the National Electric Light Association in 1929 and previously served on various committees of the N.E.L.A. For the past eleven years he had been chairman of the board and president of the Missouri-Kansas-Texas Railroad Company.

Mr. Sloan was elected president of the New York Edison Company and other electric companies in the Consolidated Gas group in 1928, following purchase of stock control of the Brooklyn Edison Company by Consolidated. He had been president of the Brooklyn utility for nine years. Placed in charge of the group of electric companies, Mr. Sloan made striking changes in their policies and operating methods. Almost immediately he announced a voluntary rate reduction estimated at $4,500,000 a year. Engineering policies were reorganized to promote efficiency and economy. He stopped extension of the direct current distribution system of the New York Edison Co., with its heavy investment costs and extended alternating current service, as he had done in Brooklyn. Also company practices in accounting, purchasing, sales and advertising were reorganized and standardized.

A native of Mobile, Ala., and a graduate of the Alabama Polytechnic Institute, Mr. Sloan first worked for the General Electric Company in Schenectady and then for the Birmingham Railway Light & Power Company and the New Orleans Railway & Light Company before coming to New York.

PERSONALS

WILLIAM MCMILLAN ROGERS has been elected president and chairman of the board of the Birmingham Electric Co., succeeding Charles E. Oakes, now president of Pennsylvania Power & Light Co., Allentown, and CHARLES S. THORN has been elected vice-president and general manager.

Election of Mr. Rogers brings to the presidency of Birmingham Electric an attorney who has specialized in the field of utility law and who has handled the legal affairs of the company for a number of years as a member of the law firm of Bradley, Baldwin, All & White. He is widely known in utility circles, having represented in rate matters and special litigation a number of utilities, including the Duke Power Co., Carolina Power & Light Co., South Carolina Power Co. and South Carolina Electric & Gas Co. Before receiving his law degree, he was graduated from Mississippi Agricultural & Mechanical College in electrical engineering.

Mr. Thorn had a background of public utility experience when he joined Birmingham Electric in 1927. Starting as supervisor engineer he became chief engineer in 1929 and in 1935 was elected to the position of vice-president. Mr. Thorn is a member of the American Institute of Electrical Engineers.

DOUGLAS W. BONNER, merchandising and power sales supervisor for the South County division of the Narragansett Electric Co., Westerly, R. I., since 1942, has been appointed merchandising supervisor for the seven New England Power System companies in the central district with headquarters at Leominster, Mass. After a year with the Westinghouse company in New York, Mr. Bonner joined the Narragansett company's sales staff at Westerly in 1930, becoming merchandise sales supervisor for the South County division in 1930.

HARRY S. SLADEN, vice-president of the Kansas Gas & Electric Co., Wichita, has asked to be relieved of his responsibilities as an official of the company. Mr. Sladen has rounded out 35 years of service. He first joined the company in 1910 as Wichita manager. Promotions came rapidly, and he became assistant general manager in 1911, general manager in 1917 and was elected vice-president and general manager in 1933.

Philadelphia Electric Co. has announced the appointment of ALEX. WILSON as manager of electric operations. Mr. Wilson's first employment with the Philadelphia utility was in 1911, as a mechanic in the station electrical division. After other engineering assignments, in 1918 he was appointed engineer in charge of construction of the Chester, Delaware and Richmond steam generating stations and the Conowingo hydroelectric development. In 1927 he was made manager of the mechanical division and in the following year he became assistant chief engineer.

In 1930 Mr. Wilson was promoted to assistant to the vice-president in charge of operations. He was made operating manager in 1936, and continued in that position until 1938, when he was appointed manager of the electric operations department. In 1941 Mr. Wilson was appointed manager of the newly created transmission and distribution department, the position he held at the time of his new appointment.

J. F. LOGAN, operating engineer, Georgia Power Co., has resigned. The duties and responsibilities of Mr. Logan will be taken over by R. O. CONWELL as system operator and by R. J. COOPER, as protection engineer, both reporting to the vice-president in charge of operation. F. J. ZARA will succeed Mr. Cooper as test engineer supervisor, reporting to Mr. Cooper. Mr. Cooper will have supervision of the application, installation and maintenance of protective and control relays, meters, automatic electrical control apparatus and related devices at the generating plants and substations of the company, as well as of other associated technical duties. Mr. Conwell, as in the past, but with more direct responsibilities, will have general supervision of system operation with respect to load dispatching and all related activities. He will also supervise and coordinate interchange power operations between the company and neighboring utilities.

O. K. GREENE has been appointed engineer of transmission and distribution of the Union Electric Co., St. Louis, Mo. Mr. Greene went to Union Electric from Laclede Power & Light Co., which was recently taken over by Union. He has been located in the offices of the superintendent of transportation and distribution.

In his new capacity, Mr. Greene will be concerned with coordinating transmission and distribution operations of the former Laclede properties through the established functional departments of the transmission and distribution division.

HARRY B. ZIMMERMAN, assistant vice-president of Buffalo, Niagara & Eastern Power Corp., and power consultant to the corporation's western division companies, has retired, after an association with the electric utility business that dates back to 1906. Starting with Niagara, Lockport & Ontario Power Co., he made subsequent connections with Grays Harbor Railway & Light Co., Aberdeen, Wash., Niagara and Erie Power Co., and Atlas Steel Co. He returned to Niagara, Lockport & Ontario in 1922 but in 1931 was transferred to Buffalo as assistant vice-president of Buffalo, Niagara & Eastern Power Corp. in charge of power sales. Later he had added to his duties the direction of the lighting bureau, heating and air conditioning and rural electrification. Since 1937 Mr. Zimmerman has been assistant vice-president, as power consultant, handling special large power contracts, as well as serving as adviser on municipal contracts.

LT. COL. ROLLIN S. ARMSTRONG has returned to his duties as Natchez district manager for the Mississippi Power & Light Co. after nearly five years of service in the U. S. Army. D. D. ARCENEAUX, who has served as district manager in Colonel Armstrong's absence, will resume former duties as superintendent of operations at Natchez.

Announcement has been made by the Puget Sound Power & Light Co. of the election of L. A. WILLIAMS, formerly executive assistant, to the position of a vice-president and of the formation of a general sales department with Henry R. Kruse, formerly manager of the economic development and research department, as general sales manager.

During his association with the Seattle utility, Mr. Williams has held the positions of sales promotion manager, dis-

trict manager (Everett) and executive assistant to the president.

Ebasco Services, Inc., service subsidiary of Electric Bond & Share Co., has announced the appointment of T. C. WESCOTT as executive vice-president and F. C. GARDNER as vice-president in charge of engineering and construction succeeding Mr. Wescott.

Mr. Wescott has been with the Electric Bond & Share system in various engineering and executive capacities for 34 years. During this period, he has had extensive business and engineering experience in industrial and utility work both in this country and abroad. He is a native of Maine and a graduate of the University of Maine.

Mr. Gardner is a native of North Carolina and received his education at North Carolina State College. He has had broad engineering and construction experience in the Bond & Share system, extending over a period of 28 years.

At the recent annual meeting of the Maryland Utilities Association, HENRY S. DAVIS, general manager of the Conowingo Power Co., Elkton, was elected president.

Other officers included: vice-president, OTIS H. RITENOUR, Washington Gas Light Co., Washington, D. C.; treasurer, J. CARL FISHER, Consolidated Gas Electric Light & Power Co. of Baltimore and secretary, RAYMOND C. BREHAUT, Washington Gas Light Co.

PHILIP J. SAVAGE, vice-president of the Detroit Edison Co., has asked to be relieved from active duty after completing 35 years of service with the company. For many years he has had executive responsibility for the company's lines, transportation, employment, medical and labor relations policies. Employment, medical, personnel and safety work of the company will hereafter be directed by SYLVESTER F. LEAHY, who has been made director of employee relations.

THEODORE R. HALMAN, who has been identified with the Detroit Edison Co. since 1922, has been appointed supervising engineer, testing and relaying, electrical system, Detroit Edison Co. KARL J. MAKINEN has been appointed relay engineer. Mr. Makinen joined Detroit Edison Staff in 1922. BERNARD D. FELLOWS, a system supervisor, has been promoted to operating co-ordinator for the electrical system. Mr. Fellows has been with the company for 30 years.

WILLIAM B. TIPPY, formerly assistant to the division manager of the Pontiac division of Consumers Power Co., has joined the New York staff of the Commonwealth & Southern Corp., to assist Vice-President J. A. BROWN in connection with the operations of Consumers Power Co., Central Illinois Light Co. and Southern Indiana Gas & Electric Co. Mr. Tippy has been identified with Consumers Power Co. since 1936.

THOMAS H. HAINES, superintendent of Boston Edison's transmission and distribution department since 1925, and assistant vice-president since 1941, has been appointed *co-ordinator of management personnel*, a newly established industrial relations position within the company. President J. V. Toner has announced that while Mr. Haines' new work will be to a degree pioneering, the major objective will be to organize procedures which will make the management personnel better informed on company policies and industry activities.

Mr. Haines is widely known in the utility industry. He was graduated from the Massachusetts Institute of Technology in 1911 and joined the company in 1913. Practically his entire career has been in the "T. and D." department, which has also involved many activities in connection with outside engineering groups and societies.

During the period of Mr. Haines' relief from his functions as head of the above department, EDWARD C. RUE will serve as acting superintendent. Mr. Rue entered the utility field after serving with the AEF in World War I in France, whence he went into New York Edison's standardizing laboratory. In 1919 he joined Boston Edison's standardizing and testing department, received a B.S. degree from M.I.T. in 1923 and became chief trouble dispatcher in the T. and D. department. Since 1925 he has been assistant superintendent.

JAMES F. ARCHIBALD has been appointed head of the overhead section of Boston Edison's transmission and distribution department, having been assistant head of the distribution operating section since 1942. Upon being graduated from Tufts College in 1925 he joined the Boston company. DOUGLAS F. TULLOCH has been appointed head of the underground section of the company's transmission and distribution department, having been head of the distribution operating section since 1942. T. A. PINKHAM, assistant head, becomes head of the underground division, and has been succeeded in his former post by K. D. GODFREY.

J. L. KILPATRICK has been appointed manager of lighting and design of the Philadelphia Electrical & Manufacturing Co., Philadelphia, Pa. Mr. Kilpatrick was associated with the Brooklyn Edison Co., with Cox, Nostrand and Gunnison and more recently with the Westinghouse Electric Corp. as lighting specialist. In this position he served as engineer on Shibe Park, Griffith Stadium and a number of other sports field lighting installations. He also served as lighting consultant on the Pennsylvania Turnpike, New York Worlds Fair as well as many airports and shipyards. Mr. Kilpatrick is active in the Better Light-Better Sight Bureau and in the Illuminating Engineering Society.

FRANK W. SMITH, a pioneer of the electric industry, has resigned as a trustee of Consolidated Edison Company and as a director of Brooklyn Edison Company, New York and Queens Electric Light and Power Company, New York Steam Corporation, Westchester Lighting Company, The Yonkers Electric Light and Power Company and Consolidated Telegraph and Electrical Subway Company. He thus terminated a connection of sixty-five years with Edison System Companies.

In 1880 he took a job as office boy with the United States Illuminating Company, an organization which first lighted Brooklyn Bridge, and he progressed from that to president of Consolidated Edison Company and other System Companies. He retired from that office in 1937.

Mr. Smith was president of the National Electric Light Association in 1922-1923.

Released from active duty with the Army, in which he had advanced to the rank of Lieutenant Colonel, E. RICHARD KELLER has renewed his affiliation with The Cincinnati Gas & Electric Company by assuming new duties as manager of the publicity department.

He had been in this department 12 years and was assistant manager when called to active duty from the Officers Reserve Corps in October, 1940. Entering the Army as a Captain, Mr. Keller received two promotions and was over-

seas 30 months, serving in Africa, Sicily and Italy. He was awarded the Bronze Star for meritorious services in support of combat operations.

Simultaneous with the promotion of Mr. Keller to manager, EDWARD F. HAVERFIELD, who has been in the Publicity Department for 12 years, was appointed assistant manager.

Announcement has been made by Jacob T. Barron, vice-president in charge of electric operation, Public Service Electric and Gas Company, of the following appointments in the company's Electric Distribution Department:

EDMUND J. THIMME, assistant to the division superintendent, Passaic Division, Electric Distribution Department to be division superintendent in that division succeeding George S. Curtis, who retired on pension June 15 after fifty-five years service with Public Service and predecessor companies.

JOSEPH J. GLATZEL, division substation engineer, Central Division, Electric Distribution Department, to be assistant division superintendent in the Passaic Division.

Mr. Thimme started with the company in 1923 as a cadet engineer after being graduated from Massachusetts Institute of Technology. In 1926 he was appointed engineer in Passaic Division, Electric Distribution Department, and became division distribution engineer in that division in 1929. In 1936 he was made district superintendent, Passaic District, and when the Paterson and Passaic Districts were consolidated in 1937, Mr. Thimme was appointed assistant to the division superintendent.

Mr. Glatzel started in the utility industry with the General Electric Company after being graduated from Rutgers University. He came with Public Service in 1926 as division substation engineer in the company's Passaic Division, Electric Distribution Department. The following year he went to Central Division as division substation engineer.

WHEELOCK WHITNEY has retired as manager of the St. Cloud Division, Northern States Power Company. He will be succeeded by E. K. THORGAARD, management representative at Glenwood.

Mr. Whitney has been manager of the St. Cloud Division since 1924 when the St. Cloud Public Service Company was acquired by the Northern States Power Company. His father, Albert G. Whitney, was owner of the St. Cloud Public Service Company. Mr. Whitney began his career in the utility field by working in various departments of the St. Cloud Public Service Company as street car conductor, lineman, meter department employee, substation operator and as an employee in the boiler room during summer vacations while attending college. When the United States entered World War I he was accepted for officers training at Ft. Snelling and later was sent to Camp Dodge, Iowa. He held the rank of Captain in the 339th field artillery when discharged from service. He was in the Army two years, six months of which were spent in France. After the war he resumed his work with the St. Cloud Public Service Company and was later made vice-president and assistant manager, which position he held until the time of his father's death in 1922, when he took up the administration of the estate.

His work with the company was interrupted a second time by war when he took a leave of absence in 1942 to accept the office of regional assistant at Chicago of the office of Defense Transportation. Late in 1943 he was promoted to the position of regional director of the Cleveland office of O.D.T.

E. K. Thorgaard has been connected with Northern States since 1923 when he was employed as an electrician's helper in the Special Construction Department at Minneapolis. Later he was transferred to the Wisconsin Division of the company and worked at Chippewa Falls, Eau Claire and Cedar Falls on substation installation work. Following this he worked in several divisions of the company in Minnesota, including the St. Cloud Division. He also worked with the Lighting Sales Department in the installation of lighting fixtures at the present general office building at Minneapolis. He subsequently served in various capacities and in 1936 became lighting sales engineer for the St. Cloud Division. He worked in that capacity until June, 1942, when he was made management representative for the western half of the St. Cloud Division with headquarters at Glenwood.

C. V. SORENSON has been elected president and a director of Indiana Service Corporation, Fort Wayne, Ind., by the board of directors.

Mr. Sorenson first entered the utility business in Eau Claire, Wis., and came to Indiana as vice-president of the Attica Electric Company in 1924. Mr. Sorenson was appointed general sales manager of Public Service Company of Indiana in 1928. In 1934 he was appointed general sales manager of Northern Indiana Public Service Company.

Looking Ahead in Advertising

(*Continued from page* 194)

others act, buy and vote emotionally, and we've got to address our story to them in terms of the *wanting mind rather than the thinking mind.*

This new approach, or repackaging, of the great story of electric service should be easy with a business as modern and challenging as the electric business is, and especially because

Every day is bargain day for electric service no matter what the customer pays for it.

It's not like selling just tobacco or soap. We are advertising and selling the whole scale of human desire—health, comfort and convenience, twenty-four hours a day—from radio's slippered hours to the saving of human lives.

Bear in mind that electric appliances are either *labor-saving* or *comfort-giving.* What a marvelous sales opportunity!

But to do this job, we must first get straight in our own thinking—in our own attitude. We've got to resell ourselves on the upward approach.

"The City of Happiness is in the State of Mind"—and our attitude on this means everything as we enter the post-war era.

I am reminded of the story of the English soldier and the American soldier approaching the border of Switzerland. They presented their passports to the customs' officer who turned to the Britisher and said, "Why, you're a subject of the King?" The British soldier immediately stood at attention, saluted and replied, "Yes, and proud of it!" When the customs' officer turned to the American soldier and said, "I see you're a subject of the United States," the American soldier replied with emphasis, "Hell no, I own part of it!"

You men and women in the utility business own part of America, and you own part of the utility business. You've got a right to be proud of it and you've got a right to sell up to the marvelous values in this business. You've got a right to sell up to dollar electric service. It's a great and challenging job.

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

(Continued)

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